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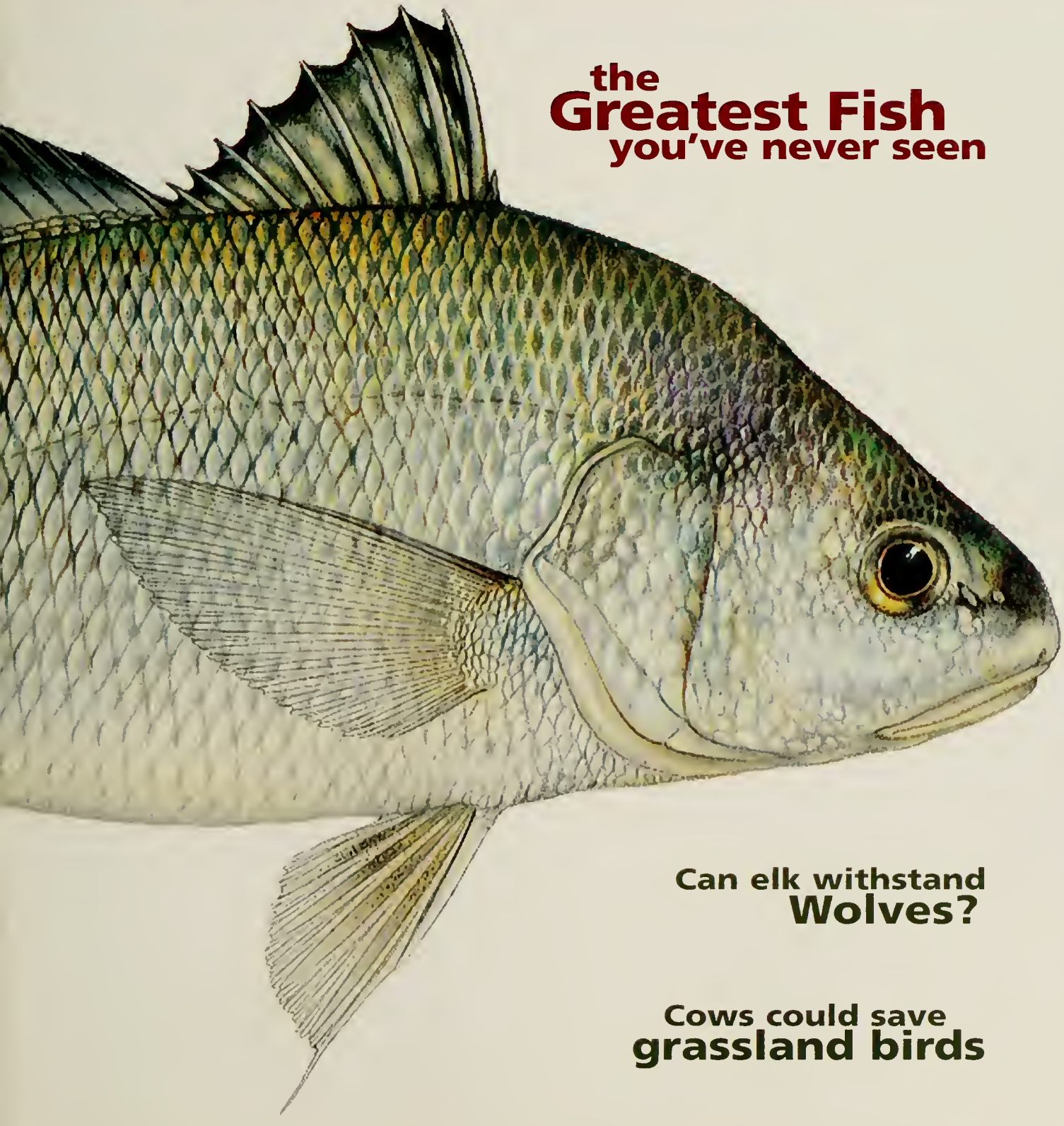

the Greatest Fish you've never seen

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Cows could save grassland birds

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WATCH OUT
How will expanding gray wolf populations affect Montana's treasured elk herds? See page 8. Photo by Daniel Cox.

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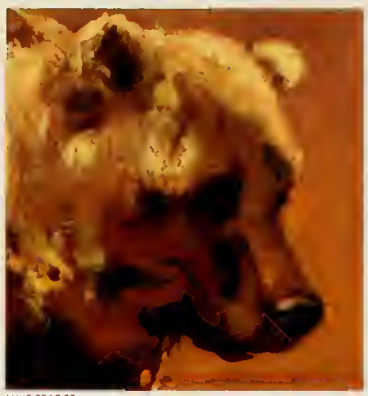
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Letters

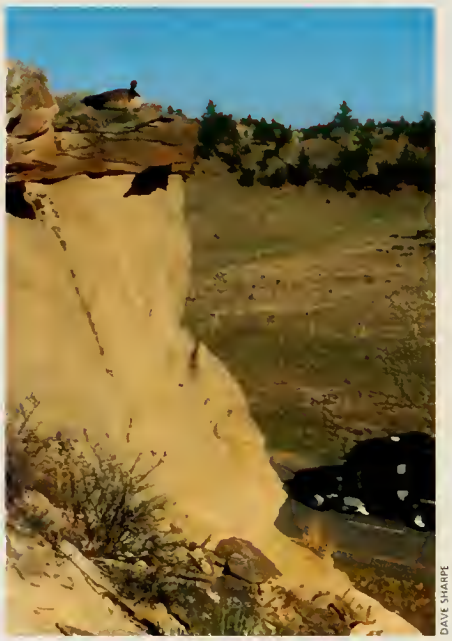
Hole-in-the-Wall Gang

I thought you'd be interested in the enclosed photo (right). In early May, while driving on I-94 near Custer, I noticed a striking, tall rock formation in the freeway median. It had a big hole in it that caught my eye, and as I was driving past I noticed what looked like a goose decoy on top of the rocks.

I pulled over and went to investigate and found a pair of geese nesting up there, in a place far better suited for falcons. In fact, it was about the worst place you could imagine for geese to nest, because they'll have to get their young down off the rock and across the freeway to the Yellowstone River, which is a mile away.

I'm calling them the Hole-in-the-Wall Gang, and I wish them luck.

Dave Sharpe
Bozeman



What's up on the Big Mo?

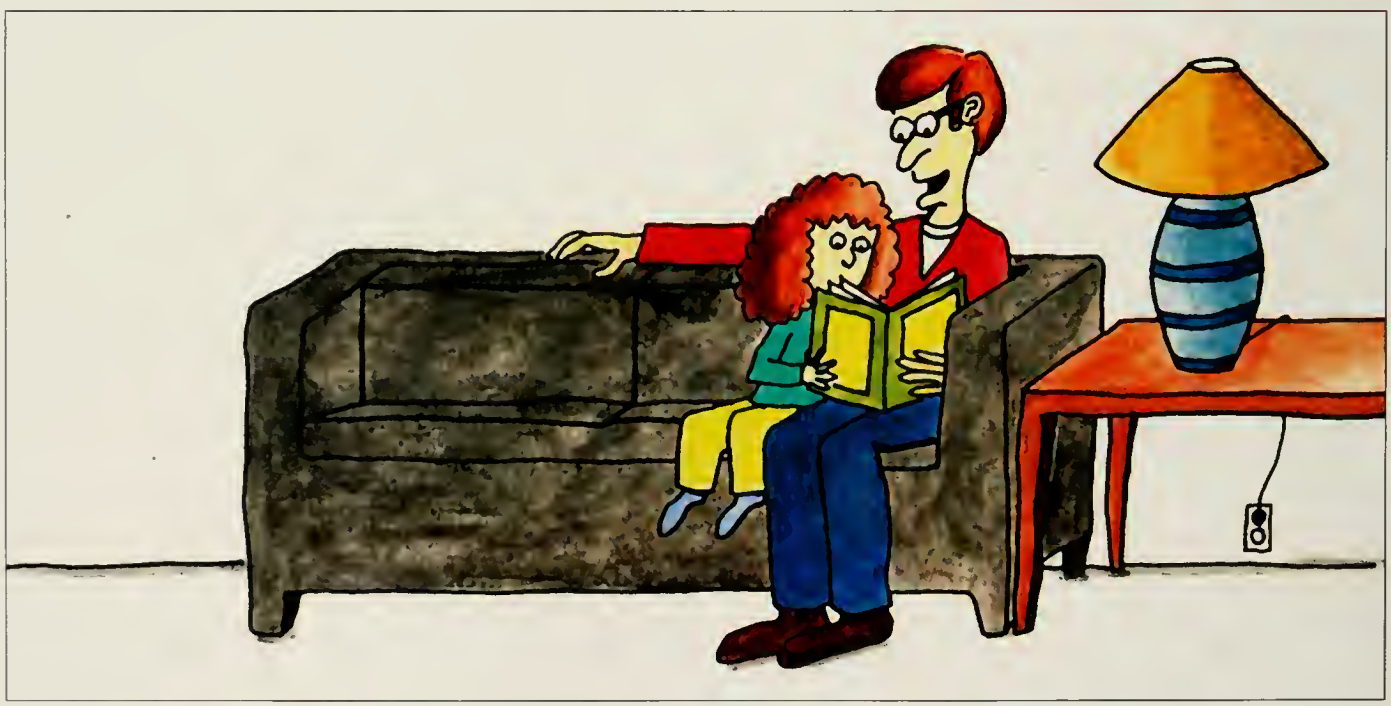
I've been reading about the Missouri River below Holter Dam and how that once-great stretch of trout water is now infected with whirling disease. Is that true? If so, what does that mean to the rainbow trout fishery there? Is Montana FWP doing anything to solve this terrible problem?

Steve Merchant
Ellsworth, Wisconsin

Editor's reply: *Unfortunately, whirling disease appears rampant from Holter Dam downstream to the Dearborn River. Below that point, however, the infection is less severe. Steve Leathe, FWP regional fisheries manager at Great Falls, says the good news is that the Dearborn, which is one of the main sources of rainbows for that stretch of the Missouri, remains free of the disease. Leathe also notes that the Missouri still offers some great fishing for adult fish that have escaped whirling disease.*

"There's not much we can do," says Leathe. "We've been finding various ways to boost rainbow trout production on streams that have little or no whirling disease, but we can't get rid of the parasite and we can't inoculate the fish."

We welcome your comments and letters to the editor. We'll edit letters as needed for accuracy, style, and length. Send your letter and a daytime phone number to: Montana Outdoors, P.O. Box 200701, Helena, MT 59620-0701. E-mail: tdickson@state.mt.us.



"Then Little Red Riding Hood said, "'Oh, my, but you are not Grandmother. You are a federally protected canine at the center of a heated, values-based controversy.'"

Natural Wonders

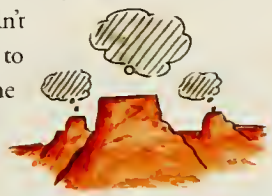
Q. *Is it true that the world's shortest river is somewhere in Montana?*

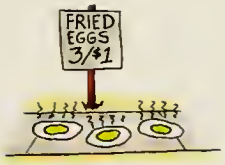
A. Yes. The *Guinness Book of World Records* recognizes both the North Fork Roe River in Great Falls and Oregon's D River as the shortest rivers in the world. The Roe rises from Giant Springs, one of the largest springs in the United States. Dave Todd, regional state parks manager, says the mighty Roe flows 58 feet from Giant Springs to its confluence with the Missouri River in Great Falls. (To our knowledge, Lewis and Clark never considered it a route to the Pacific Ocean.)

Q. *What exactly is a butte?*

A. David Alt, co-author of *Roadside Geology of Montana*, says a butte is simply "any conspicuous and isolated hill—a landmark."

Some buttes are actually frustrated volcanos. The molren rock rose up and hit a layer of sedimentary rock but couldn't break through to the surface. The magma eventually cooled into igneous rock that, over time, was revealed by erosion. Not all burtes are flat topped. Many of Monrana's buttes—flat topped and not—are between Great Falls and Helena and can be easily seen from Interstate 15.





Q. *Where's the state's hottest spot?*

A. According to the National Climatic Data Center, the five hottest places are Hardin (Big Horn County, average daily high in July: 91.7°), Yellowtail Dam (Big Horn, 90.7°), Lame Deer (Rosebud, 89.9°), Birney (Rosebud, 89.8°), and Hysham (Treasure, 89.6°). Montana's highest mercury reading of 117 degrees F occurred twice: in Glendive on July 20, 1893, and in the state's northeastern corner on July 5, 1937.

Curious about Montana's outdoors? Send your questions to our mailing or e-mail address on page 2.

Our Point of View

Does this agency strike you as extreme? Some have accused us of that, of being far too biased on one issue or another. Usually the charge comes from those who disagree with our position. For example, some environmentalists insist we're in the pockets of industry. Yet, at the same time, some industry representatives have maintained that we're far too green.

The fact is, we're rarely on the extreme ends of any issue. Nor should we be. We're a public agency representing the diverse interests of all Montanans. Not just the ones who yell the loudest. Not just the ones with the most money and political clout. And not just the ones who buy licenses.

What that means is that we often take a moderate position on issues. If it appears that we ever go "too far" on any issue or policy, believe me when I say that I could always find a group of citizens angry that we didn't go nearly far enough.

Here are some issues we're now grappling with thar incite strong passions among Montanans and visitors:

1. Grizzly bear and wolf recovery and plans for state management of these currently federally protected species.
2. Sage grouse and prairie dog conservation.
3. Controlling the growing elk herds in areas where the animals are causing depredation.
4. Managing whirling, chronic wasting, and orher fish and wildlife diseases.
5. Providing access to public and private lands while respecting property rights and maintaining positive landowner relations.
6. Managing social issues such as river crowding.
7. State parks: how many should we have, how much development is appropriate, and how should we fund the parks program?
8. Increased demand for motorized and non-motorized trail use.

MONTANA FWP

All these diverse outdoors issues have one thing in common: No matter how hard we try, we won't be able to make everyone happy. There will always be committed, well-meaning people on either side of an issue who think we either sold out and didn't do enough—or that we went way too far.

Our generally moderate stance on many fish, wildlife, and state parks issues does not mean we don't take a stand. We do. We are committed to conserving Montana's resources—using the best science available—in order to provide sustainable opportunities to fish, hunt, watch wildlife, and visit state parks now and far into the future. Conservation is our mission. But conservation is a broad concept that has lots of room for differing opinions. In future columns, I'll explain in more detail the various issues listed here, our opinion on each, and why we've taken that particular position.

—*Jeff Hagener*, Director

Montana Outdoors Report

New elk study shows tighter regulations may not produce more trophy bulls

A recently released report of a major FWP elk study shows that restricting bull elk harvest to branch-antlered (BAB) or brow-tined (BTB) bulls did not produce larger-antlered bulls. The 12-year study, "Effects of Hunting Regulation Changes on Elk and Hunters in the Gravelly-Snowcrest Mountains, Montana," was conducted from 1984 to 1996 in an area of southwestern Montana between Ennis and the Idaho border.

The study was done to find out if the increasing proportion of young bulls in elk herds where any-antlered bull hunting regulations were in place was affecting breeding efficiency and reducing the production of calf elk.

"Studies in other states show that young bulls may breed cows later in the breeding season compared to older bulls," explains FWP wildlife research biologist Ken Hamlin, who co-authored the report. "If cows get bred late, their calves are born late and they are weaker when entering winter."

The study looked at whether regulations that protected spike (yearling) bulls would allow more of them to survive and breed as two-year-olds, so that less of the breeding would be done by yearling bulls. Many hunters also were interested in the study because they hoped that the regulations would produce older, larger-antlered trophy-class bulls.

Researchers captured nearly 1,000 calf, cow, and bull elk and marked the animals with ear tags, 549 radio collars, and 342 neckbands. They then followed the seasonal movements of the elk and recorded mortality rates and causes in relation to winter severity, hunting regulations, and hunter harvest. They also monitored changes in hunter harvest and in the total number of elk and proportions of calves, cows, and bulls (yearlings, two-year-olds, and those three years old and older) in the population.

JOHN R. FORD

RARE RACKS: FWP wildlife biologists found no easy fix for producing bigger bull elk.

Among the study's findings:

1. **The low proportion of older bulls in the breeding population of the late 1970s and early 1980s likely did not affect calf survival rates.** Hamlin and co-author Michael Ross found that calf survival actually began increasing before BAB harvest regulations produced increased numbers of two-year-old breeding bulls.

2. **Creating a harvest regulation of only branch-antlered bulls—intended to protect yearling bulls so that more could survive to grow older—resulted in only a small increase in the total number of bulls in the herd.** That's because many spike-antlered yearling bulls were illegally or mistakenly shot, says Hamlin. He explains that some hunters mistakenly thought they saw branches on spike bulls when hunting in thick cover, while others apparently shot first and checked for branching after the bull was down.

As a result of this illegal mortality of spikes (25 to 35 percent) and the legal harvest of branch-antlered yearlings, about 40 percent of yearling bulls did not survive to become two years old, and the number of bulls legally harvested did not increase with the BAB regulation, despite an increasing elk population.

3. **When the regulation was changed to restrict hunters to brow-tined bulls (adult-formed antlers age two and one-half and older), the researchers found that illegal killing was much reduced, to 15 percent of yearling bulls.** "We found that hunters could judge whether or not a bull had a brow tine easier than they could determine whether a yearling bull was a spike or had small branched antlers," Hamlin says.

4. **The brow-tined bull restriction also did not result in producing significantly more older, larger-antlered bulls.** "It increased the average age of breeding bulls by about one year," says Hamlin, "but hunters were still killing 75 percent of those bulls in this relatively open habitat, so few survived to reach age five, when bulls really start to reach the trophy size that hunters tell us they want."

Mining company leaves land legacy

It's a story that elk hunters, cutthroat anglers, and miners can love.

Recently, the Beal Mountain Mining Co. deeded 340 acres of prime wildlife habitat to Montana FWP to be added to Mt. Haggin Wildlife Management Area in Silver Bow County. The land donation was part of a mitigation agreement first reached in 1988, when the mining company (then called Pegasus Gold) opened a mine near the WMA and had to drive trucks across the public wildlife area on a road improved to truck-haul standards.

According to Craig Fager, FWP wildlife biologist at Butte, the new land donation—along with 1,000 acres that Pegasus donated in 1988—contains prime elk and mule deer habitat. Moreover, a 30-acre parcel donated in 1988 is a popular access point to German Gulch, which contains one of the highest densities of pure strain westslope cutthroat in southwestern Montana.

"These are some great wildlife and fisheries parcels," says Fager. "There was definitely some long-term impact done to the WMA by the haul road, but I think it was more than offset by this substantial donation of property."

GREAT FALLS 5TH-GRADER TAKES TOP POSTER PRIZE

A painting by Chris Peck, a fifth-grade student at Lewis & Clark School in Great Falls, was selected as the top submission for the 11th annual Montana Fish, Wildlife & Parks student state parks poster design contest.

This year's theme was "Montana State Parks: A Symbol of Freedom, Hope, and Inspiration."

Students were instructed to use their artwork to convey the freedom to camp and hike, the hope that everyone can always enjoy the natural beauty of state parks, and the inspiration that comes from the parks' abundant wildlife.

Peck captured the challenging theme in his rendition of Elkhorn State Park. He received a $150 savings bond and a T-shirt depicting his original artwork. The Lewis & Clark School library received a Montana State Parks video and books valued at $50.

Second place went to Jeffrey Wigen from Hobson who used the state symbols, his local landscape, and patriotic images to express the contest's theme. Wigen received a $100 saving bond and a T-shirt.

Tying for third place were Ashley Beatty from Central Elementary School in Helena and Ashley Alvalle of Lewis & Clark School in Great Falls. Beatty featured wildlife "hidden" in the mountains of Hauser Lake State Park in her illustration, and Alvalle's poster displayed several species of wildlife that can be seen while hiking in Sluice Boxes State Park. Each received a $50 savings bond and a T-shirt.

1ST PLACE Chris Peck, Great Falls

2ND PLACE Jeffrey Wigen, Hobson

3RD PLACE (TIE) Ashley Beatty, Helena

3RD PLACE (TIE) Ashley Alvalle, Great Falls

Automated licenses inspire queries

"What the...?" Such has been the response of many anglers and hunters after buying their 2002 Montana fishing or hunting license, issued for the first time with ALS, the automated licensing system. State officials expected some confusion because the new system is unfamiliar to buyers and license vendors and the licenses look nothing like ones issued previously.

"We knew from talking to other states there would be a few inevitable kinks the first year we'd need to iron out," says Ron Aasheim, head of the agency's Division of Conservation and Education. "We're asking license buyers to be patient and bear with us on this one."

Among some common questions, and the agency's response:

Q. There are too many tags, they're too big to fit into my wallet, and the pouch adhesive material doesn't work. Can't you fix this?

A. The agency has ordered smaller tags that have a better pouch adhesive. We can't reduce the number of tags issued because each harvested animal must be tagged with a separate tag.

Q. Why is the license paper so flimsy and difficult to read?

A. Licenses are run through a specific computer printer, so the type and quality of paper available is limited. The ALS machines can't use waterproof paper, so for now we're providing waterproof pouches for the licenses and will continue to look for sturdier paper.

Q. What is my "ALS number"?

A. Your ALS number is your life-long, unique identification number that you will use for all official FWP transactions—from buying hunting and fishing licenses to buying State Parks Passports.

Your ALS number comes in two portions. First is your numerical date of birth, which is printed in the upper left hand corner of your license as (for someone born on July 8, 1987): "DOB: 07/08/1987."

MONTANA OUTDOORS

PUZZLED PATRON: The new fishing and hunting licenses aren't as confusing as they look. Honest.

The second portion is a number based on when you purchased your first ALS license. For example, the first person to purchase a license who was born on July 8, 1987, will be assigned number "1." That number is printed in the upper right hand corner of the license as "ALS#: 1." So, for this example, the sportsperson's complete ALS number would be "07/08/19871."

2001 white-tailed deer deaths due to summer midge boom

Last fall hunters and landowners reported seeing unusually large numbers of dead white-tailed deer in the central and northeastern parts of the state. They weren't imagining things.

"In Fergus, Blaine, and Phillips counties," says Keith Aune, head of FWP's wildlife laboratory in Bozeman, "whitetails suffered 60 to 75 percent mortality from EHD."

EHD—epizootic hemorrhagic disease—is always present in deer populations, Aune notes. But only in years when conditions are just right, like in 2001, do major outbreaks occur.

"Last year in central and northeastern Montana we had a warm, dry spring followed by late-summer rains," he says. "The rains created lots of puddles, which provided great habitat for the midges that transmit the EHD virus." Often called gnats, the midges that carry the disease are tiny biting insects of the genus *Culicoides*.

"The dynamics of midge populations really drive this disease," says Aune. "When conditions are right, it can spread exponentially. Wind plays a part by spreading clouds of midges over considerable distances."

Though the EHD virus can live in many mammal species, most are resistant to the disease or only mildly affected.

"Mule deer, elk, antelope, and cattle can all carry it, but whitetails are hardest hit," says Aune. "The virus 'hides out' in the other species, providing a reservoir for future outbreaks of the disease."

As EHD runs its course in whitetails, the deer become lethargic or disoriented and may bleed from the nose or mouth. Eventually they stop eating. Infected deer typically develop a fever and head toward water, which explains why many dead ones are found near ponds, lakes, or streams.

Why are some years worse than others? "We know weather is a primary factor, but we haven't ferreted out all the nuances of these epidemics," says Aune. "We do know that when events converge to favor spread of the disease, we see an epizootic [animal epidemic] like the one we had last summer."

EHD isn't contagious from one animal to another, nor is the disease transferable to humans. Animals must be bitten by a virus-carrying midge to contract the disease. Hunters are not at risk by handling infected deer or eating venison from infected deer.

Most deer mortality takes place in late summer or early fall, before cold weather. Though white-tailed deer populations are never completely wiped out by EHD, they can be substantially reduced in some small areas.

Montana FWP has lowered deer harvest quotas for the 2002 hunting season in areas hit hard by EHD last year to allow these herds to recover. ■

Trophy doe hunt

By Jim Conner

This last hunting season, some areas of Montana had far too many deer. Mule deer and white-tailed deer populations in these places were soaring due to three previous mild winters.

For Montana FWP, this can spell trouble, because high deer numbers can lead to massive depredation on farms besieged by hungry deer and deer starvation during severe winters.

Increasing the doe harvest can help reduce overpopulation—but only if hunters hunt does. Unfortunately, many prefer to shoot a trophy buck with the hopes of having its big rack entered into the Boone and Crockett record book.

The solution, in my mind, is for there to be some sort of trophy doe equivalent to the Boone and Crockett scoring system. And I think Montana FWP needs to promote trophy doe hunting.

Trophy does? Now bear with me on this. I myself have been hunting trophy does for the last several years. In fact, for a while I held the unofficial mule deer doe world record (a "friend" bested me last fall), and my daughter Lacy continues to hold the unofficial white-tailed deer doe world record. Both were taken by rifle in the Lewistown area. (In the interests of full disclosure, I must note that my children and I are the official recordkeepers, scorekeepers, and participants of this international competition.)

Many landowners contribute to our quest for record book does by granting us permission to pursue this game animal.

I tell them we search long and hard for does that fit the requirements for entry into "the book." That means taking only the oldest and biggest does, the ones often referred to as an "ol' battle axe." It also means taking the ones with the biggest and widest-set ears.

That's right. The measure of a trophy doe is the ears: the width between the tips of each ear added to the width of each ear. To measure, lay both ears flat and separate them so you can measure their maximum distance apart without pulling or yanking the skin from the skull. (We do not break the measurements down to 1/16 inch or smaller increments.) Measure ears before the deer stiffens, which happens about three hours after the animal dies. Measure ear width by laying the ear flat and measuring the widest point from side to side, usually halfway up the ear.

Another requirement for out records is that the deer must be taken on private property. No use harvesting a trophy doe on public lands, where the deer do little damage to crops or haystacks.

My biggest mule deer doe measured an astounding 19 ¼ inches from ear tip to ear tip, and a huge 4 ½ inches wide on both ears at their widest point. That's a phenomenal total of 28 ¼ points. (I won't divulge the ranch because, like any trophy hunter, I don't reveal my secret spots.) This last year I got a doe off the same ranch that was only one-quarter inch gross score smaller. The trophy gene pool runs deep in this area.

The world record whitetail doe was Lacy's first deer. She had wanted a big buck, but they had not cooperated, so we went out to a spot near town, lay down near a stubble field, and watched a doe and two fawns mosey into firing range 30 minutes after we arrived. Lacy dropped the doe with one shot. The ears came out to an even 16 inches across and 3 ¼ inches wide for a total score of 22 ½ points.

Now you have some estimate of what a record doe measures.

Harvesting a trophy doe is harder than it looks. Even areas containing many deer often have far more fawns and yearlings than mature does. And ear measurements are hard to estimate without horns or other facial features to help.

So why bother? For one thing, a trophy doe is bigger than a yearling or spike buck. That means meat hunters get mote for their money. For another, harvesting a big doe helps reduce herd size. Not only do you remove that particular animal but also all the future fawns she would have borne. And finally, as I hope I've made convincingly clear here, hunting a trophy doe is a challenge in its own right.

So take my advice this fall and go out and find a big herd of hay-burning does and ask permission to hunt. You'll likely get a positive reply when you tell the landowner you're out to bag a trophy doe for the record book. ■

Jim Conner, a FWP game warden based in Lewistown, is the self-proclaimed one-time world mule deer trophy doe record holder.

Will wolves wipe out Montana's elk?

By Tom Dickson

WOLF FEEDING ON ELK IN YELLOWSTONE NATIONAL PARK BY DONALD M. JONES

Though biologists say no, some hunters say yes. A new study could provide definitive answers.

On a windy morning in late April, John Winnie hikes up a side drainage of the upper Gallatin Canyon, in the northwestern corner of Yellowstone National Park. The 42-year-old Montana State University wildlife biology doctoral candidate keeps his eyes glued to the ground, barren but for scattered patches of clipped Idaho fescue and clumps of sage. In a backpack he carries the tools of his trade: radio receivers, climate condition measurers, binoculars, notebooks, plastic vials, plastic bags. As he nears a remnant snowdrift showing fresh elk tracks, Winnie kneels down to scoop a handful of fresh, marble-sized elk pellets into a vial.

"This," he notes wryly, "is the glamorous part of the job."

Collecting elk droppings may not put Winnie on the cover of *Scientific American*, but the information he gathers from analyzing hormones in the feces could help determine how Montana's biologists manage both elk and wolves in the future—no minor achievement. He and MSU graduate student Justin Gude are taking part in a five-year multi-agency study begun in 2000 that aims to determine what effect the wolf population expanding north and west from Yellowstone National Park will have on Montana's prized elk herds. As federal delisting of the wolf appears to near, management authority could soon revert from the U.S. Fish and Wildlife Service to the states where wolves thrive. When that happens, state biologists will need to factor in wolf predation as they decide how best to manage elk and other ungulate (hoofed mammal) populations.

"There's a great deal of uncertainty right now," says Kurt Alt, a FWP biologist at Bozeman, the epicenter of a growing controversy over wolves and elk. "This is the first time biologists in Montana have had to really deal with a situation like this, where basically wolves have been dumped in our lap. Right now there just isn't enough data on wolves and elk for us to make the best possible management decisions."

Information already exists

Many hunters, however, say plenty of information currently exists showing that wolves are devastating elk populations. Some of their main concerns:

- The number of wolves is growing and the population is spreading. Recent counts in the Greater Yellowstone Ecosystem showed 218 wolves, up substantially from the 31 introduced to the park in 1995-96. Statewide, Montana has at least 100 wolves, which includes wolves spreading south from established populations in the state's northwestern region and those moving north from Yellowstone National Park and central Idaho.
- The current northern Yellowstone elk herd count of 11,969 is down from last year's count of 13,400 and well below the historic peak of 19,000 in the mid-1990s. This herd gets the most attention because of its large size and important late-season harvest as the animals move north from the park in winter.
- Of greatest concern, say local hunters, is the decline in calves, which they blame on wolf depredation and say indicates a weakened population that can't sustain itself. They point to a 1997 University of Michigan study of the northern Yellowstone elk herd that showed a link between low elk calf numbers and both high wolf densities and expanding wolf populations. What's more, surveys by Yellowstone National Park biologists this past spring found an average of 14 elk calves per 100 cows in the northern Yellowstone elk herd, the lowest ratio in decades. Generally this ratio, or "recruitment rate," has been 20 to 30 calves per 100 cows in recent years.

"I can understand why the wildlife professionals can't be definitive about this," says Rep. Joe Balyeat, whose district covers the Gallatin Canyon, "but the evidence seems to strongly suggest that the low calf:cow ratio is being caused by wolves."

That, in turn, could lead to an elk disaster, says a citizen's group called Friends of the Northern Yellowstone Elk Herd (FNYEH). Based mainly on member

EVER ALERT: Elk in the Madison, Gallatin, and Yellowstone ranges are increasingly under threat as wolves spread from Yellowstone National Park. Some hunters worry the predators will decimate elk herds. Some scientists maintain that declining elk numbers in Yellowstone National Park have little to do with wolves. "I think there have been overstatements on both sides," says one Montana FWP official.

DENVER BRYAN

observations, the group says Yellowstone's elk population is on the verge of collapse and that southwestern Montana elk herds may be next. "It's going to crash," says FNYEH president Bill Hoppe, who lives near Gardiner along the park's northern border. "It won't take much longer."

Record elk numbers

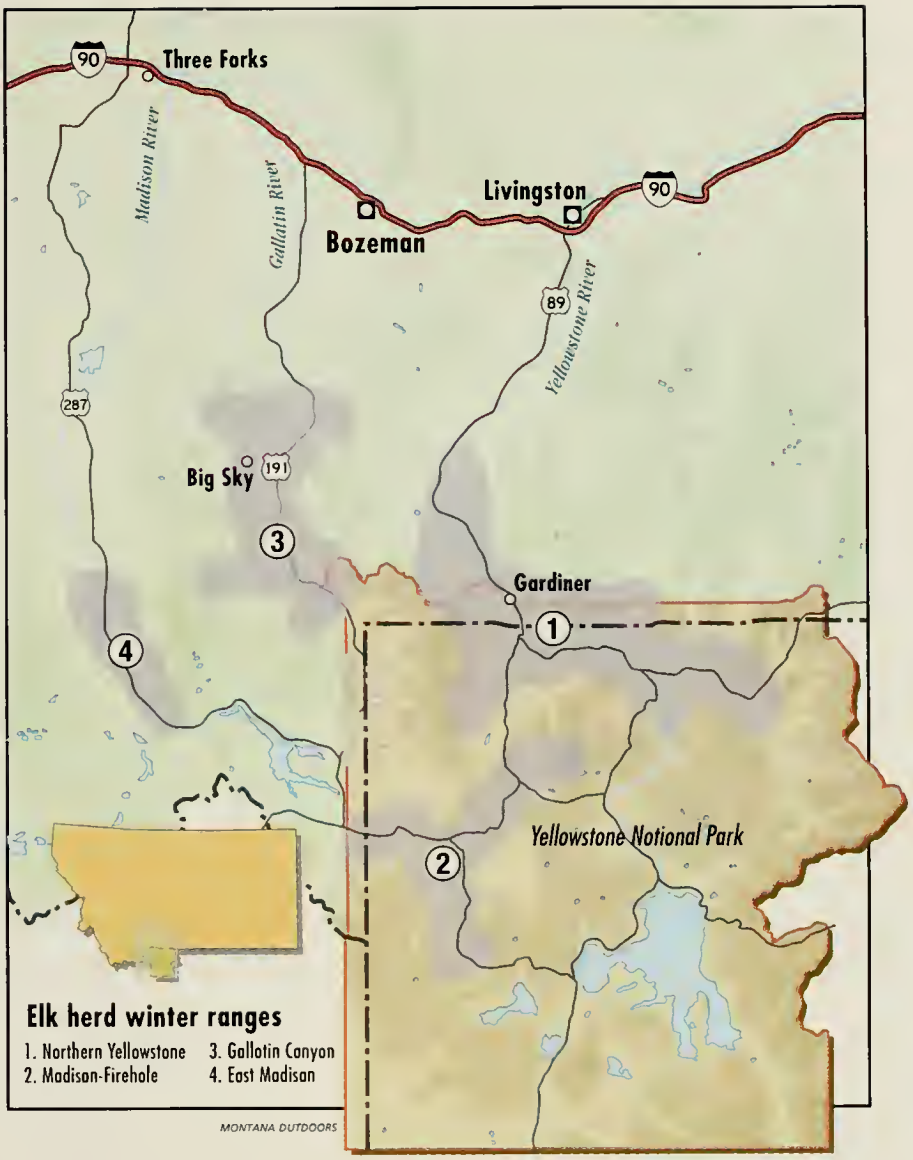
Biologists aren't buying the imminent, widespread elk apocalypse scenario, however. Tom Lemke, FWP wildlife biologist at Livingston, notes that even though wolf numbers are increasing, Montana's elk populations are currently at record highs in parts of the state. "In the four hunting districts that surround Livingston, we've got more elk than we've ever had since we began counting in 1974," Lemke says.

In one of his districts, elk numbers have grown from 100 to 1,400 in the past 28 years. And in most of the state's south-central region, elk numbers are so high that this fall Montana FWP will allow an unprecedented cow elk harvest to bring the population in line with available habitat and landowner tolerance.

Regarding fears of a declining northern Yellowstone elk population, biologists say they consider the 19,000 figure to be a nonsustainable extreme. "We can't manage wildlife at their historic population highs," says Alt, who adds that the Yellowstone herd's 35-year population average is about 14,000 elk.

Biologists also point out that the Yellowstone herd differs significantly from other Montana elk herds, primarily because it is protected from harvest except during the late hunting season.

"Yellowstone elk," notes Lemke, "endure harsh winter conditions, live in a predator-rich environment, and have a population that fluctuates from 10 to 40 percent annually." This population differs from Montana's managed (hunted) populations, which have fewer natural predators, less winterkill, and yearly population fluctuations of only 5 to 15 percent. Adds Lemke: "The Yellowstone scenario may not be a good predictor of what will happen in the rest of Montana."



As for elk recruitment, wildlife experts agree the low calf:cow ratio is troubling, but they don't agree that wolves are the only or even the main cause. Ken Hamlin, FWP's elk researcher, notes that elk recruitment rates dropped throughout Montana this year, even in areas with no wolves.

"We know wolves are having an impact, because they eat red meat for a living," Hamlin says. "But at this stage we can't say what proportion of it is due to any specific cause. For all we know, some of the decline could be due to mountain lions, grizzlies, the long-term drought, high densities of elk reaching their maximum forage carrying capacity, or other factors. Something has to account for the decline in calf:cow ratios in areas that have few or no wolves."

The new study

Hunters say one thing, biologists another. So what actually *is* happening between wolves and elk in southwestern Montana?

A five-year research project begun in 2000 aims to find out. At five different sites covering roughly 500 square miles in the Greater Yellowstone Area, Winnie, Jude, and other researchers are monitoring the effects of wolves on elk demographics (numbers, population dynamics, reproductive rate, and health) and elk distribution (behavior and movement).

Not only is this one of the most geographically expansive studies of wolves

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Tom Dickson is editor of Montana Outdoors.

and elk ever conducted in North America, the project is also looking at an exhaustive range of factors that could affect elk when wolves move into the region. Among those being measured: elk herd density and size, wolf pack size, weather conditions, snow depth, hunter harvest, elk habitat, and distance to safety cover. By testing these various parameters, scientists can pinpoint specific factors that may, for example, increase or decrease predation (such as the presence and duration of snow crust that can support wolves but not the elk they chase down).

"The studies are looking at two basic questions," says Alt. "How are wolves affecting elk distribution and how are they affecting population numbers?"

Most other wolf-elk studies have been conducted within Yellowstone National Park, where, due to the lack of hunting, the elk herd is older and more susceptible to population extremes. The new studies focus on elk outside the park, where the herds are managed with regulated hunting seasons that keep herds young and healthy.

"The park elk are at the edge of their biological carrying capacity," says MSU Ecology Department professor Bob Garrott, who has been studying elk and wolves in the park's Madison-Firehole (western) region since 1991. "Those elk are not as robust as those outside, and predation there could be much higher than it will be elsewhere as wolves spread into Montana."

DENVER BRYAN

PACK MENTALITY: As wolf numbers grow, so do concerns that the predators will compete with hunters for elk.

During their November-to-May study season, Winnie and Gude track wolves and elk fitted with collars that emit radio signals. (Because wolves are hard to capture for collaring, the researchers also look for fresh tracks and spot wolves from the ground.) They keep tabs on elk numbers to make a yearly estimate of each elk population, describe how elk herds in the study areas move each week, and check the survival and reproduction levels of adult cow elk. "The bulls aren't studied as much, because the cows are what sustain the population," says Winnie.

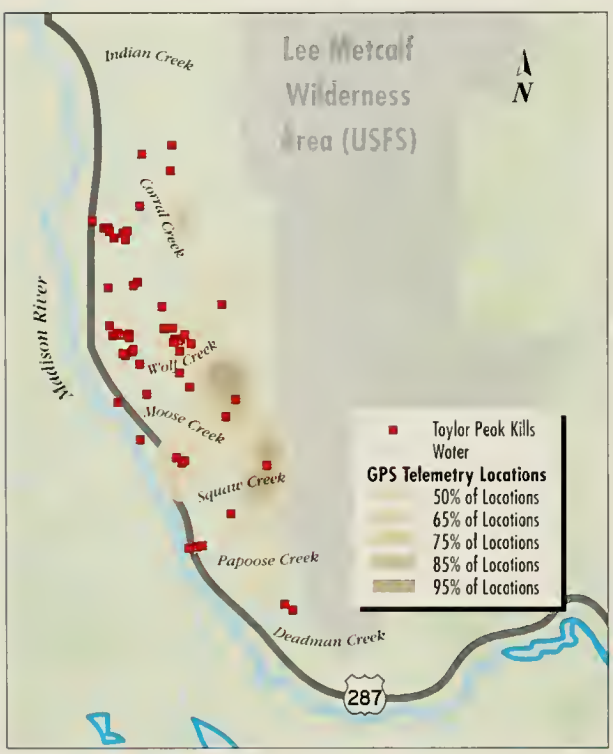
In their respective study areas—Winnie in the upper Gallatin Canyon and Gude in the Madison Valley—the researchers monitor elk in early morning and late afternoon. A "mortality sensor" on each radio collar announces when a collared elk stops moving for several hours, indicating it is dead. Once that happens, the researchers race to the site to determine how the elk died. By looking for blood trails, signs of struggle, and hemorrhaging patterns under the skin, they can determine whether wolves made the kill or simply found an elk felled by starvation or disease.

The researchers also record the elk's sex, age (by examining the teeth), and condition (by analyzing marrow fat content from a section of femur they cut from the carcass).

The particular focus of Winnie's study is on how elk change their distribution and behavior when wolves show up. For example, do the ungulates spend more time in winter watching for wolves and less time feeding, thus making them weaker and more susceptible to disease and starvation?

"One thing I'm doing is looking for a trend in each drainage, to see if wolves are pushing elk out of their prime feeding habitat into the trees, and if that translates into a reduced caloric intake," Winnie says.

Meanwhile, Gude is focusing on finding which variables most affect wolf predation on elk, and how many elk wolves actually kill each winter.



JUSTIN GUDE/MONTANA OUTDOORS

Many interests watching

The stakes of their research are high. Montana's prized elk herds are hugely

DANIEL J. COX

WHERE ARE THEY? MSU graduate students John Winnie (below left) and Justin Gude (below right, in blue jacket) track the locations of elk and wolves throughout their study areas. The researchers use scopes, binoculars, and radio receivers that beep when wolves or elk fitted with radio collars are nearby. Some collars also contain a Global Positioning System unit that collects and stores information on an animal's location 12 to 18 times per day. The unit is programmed to drop off after 11 months so biologists can collect the collar and the data it stores. A collar on a Taylor Peak wolf collected 1,100 locations in the winter of 2000-01, revealing the daily movements of the pack. Gude overlaid a map of kill sites with wolf use areas (far left) and found that most kills were outside the core use areas. "That could mean that when wolves are heavily frequenting an area, they aren't necessarily hunting," he says.

TOM DICKSON

TOM DICKSON

DONALD M. JONES

DANIEL J. COX

DANIEL J. COX

DONALD M. JONES

TO WHAT EFFECT? No one argues that wolves eat elk. But how many? And what other effects do the predators have on these prized game species, such as reducing the number of calves or causing elk to spend more time watching and less time feeding? That's what researchers in the new study aim to find out, and then to provide that data to Montana's wildlife managers. "Wolves are not going to change how we manage wildlife," says one FWP biologist. "We'll still use the best information available and we'll still use that information to make the best possible decisions."

popular among residents and visitors. Over the past 80 years, hunters have spent hundreds of millions of dollars restoring elk populations decimated by unregulated, market hunting. Elk now thrive in Montana, and "hunters are rightfully proud of what they've done," says Alt, who adds that a wolf restoration would not have been possible "if it weren't for elk hunters bringing back that huge prey base."

Elk comprise a large part of the roughly $14 million Montana FWP generates each year in big game hunting license revenue. The money is used to conserve winter habitat to maintain healthy elk populations. Half the state's elk harvest comes from the southwest region surrounding Yellowstone National Park, which is why all eyes are on the wolves spreading north and west from the park.

Over the past 80 years, hunters have spent hundreds of millions of dollars restoring elk populations....

"What hunters are concerned about is what this [expanding wolf population] means to their hunting opportunities," says Jeff Herbert, who heads FWP's wildlife research unit. "That's what these studies are trying to find out."

Yet wolves also have a loyal and influential constituency. And these folks aren't all "Easterners" imposing their will on Montanans, says David Gilliard of the Bozeman-based Predator Conservation Alliance. He contends that many Montana residents object to the notion that elk are the exclusive domain of hunters, to be treated as a commodity.

"There's more to wildlife management in Montana than maximizing hunter harvest," says Gilliard, "and most of the hunters I talk to agree. They understand that wolves have a role in making wildlife wild, and how a big part of the hunting experience is that you're out there with the full complement of wildlife, including predators."

Another related issue keeping wildlife biologists awake at night is elk depredation. The 400- to 1,000-pound animals eat crops, graze pasture meant for cattle, and reduce massive hay bales to scraps, sending furious ranchers and farmers to their telephones to demand relief.

"On state wildlife management areas we've worked hard over the years to manage winter range for elk, in part to build the herds but also to keep them off private land," says Glenn Erickson, chief of FWP's Big Game Bureau. "We need to learn how wolves might move elk around and change their distribution."

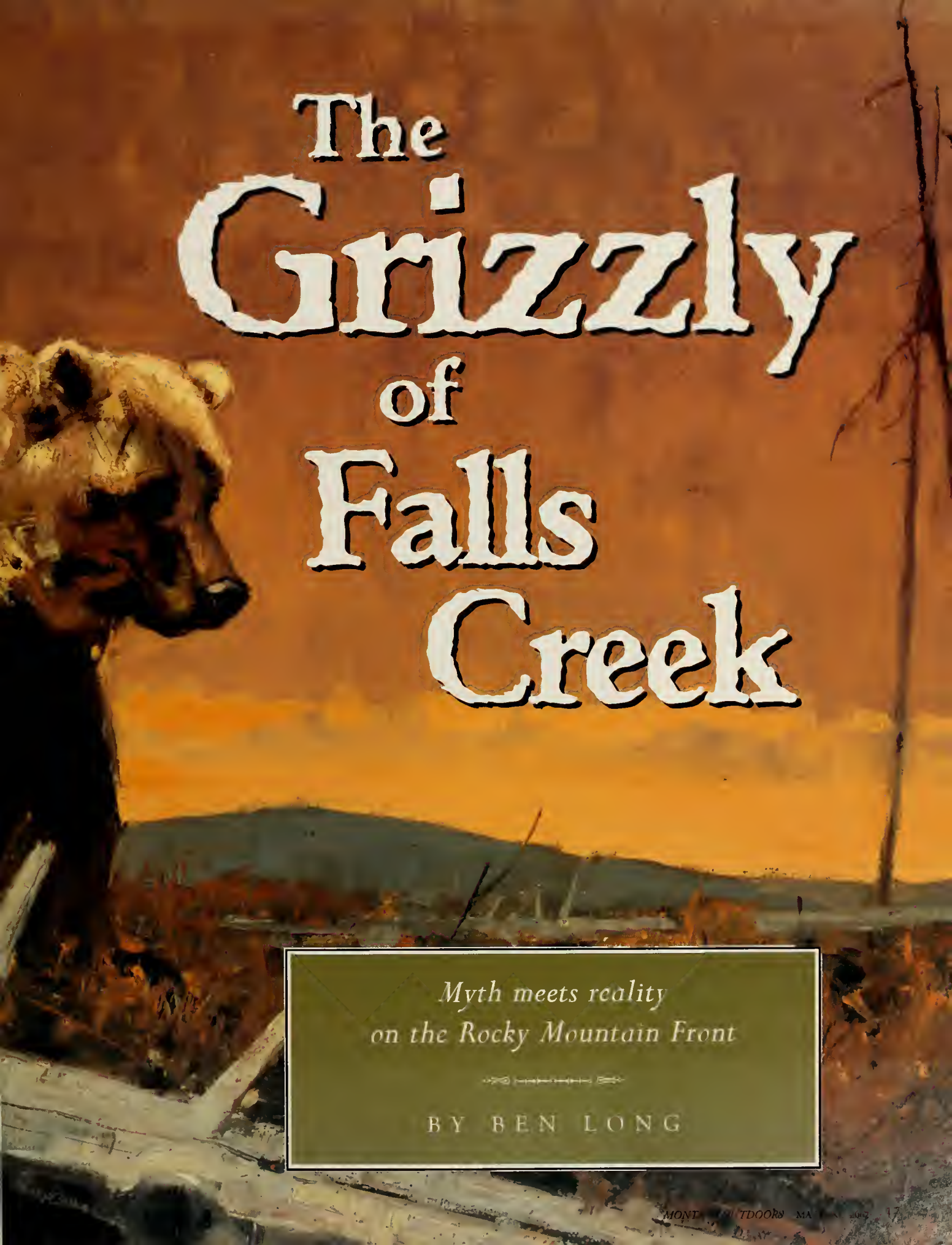
On a chilly spring afternoon, Gude and MSU wildlife technician Thain Cook hike across a wind-whipped range to the top of a rise overlooking the Madison Valley. Below, in the distance, a herd of what appears to be more than a thousand elk graze in an area the size of 20 football fields. As Cook records temperature, wind speed, and other conditions, Gude sets up his spotting scope and begins counting, in groups of five. After 10 minutes he steps back from the scope and announces, "One thousand six hundred and fifty-one." On the way back to the pickup, Gude points to a site in the distance where the only two wolves now in the valley have recently set up their den. Looking back at the sea of elk, still visible a half-mile away, he says, "You'd think there could be a lot more wolves in this valley before they'd have much of an effect on that herd."

Perhaps. But it will take time, and a lot more research, to find out for sure. ■

Because roughly 570 gray wolves now inhabit the federal wolf recovery areas in Montana, Idaho, and Wyoming, the U.S. Fish and Wildlife Service could propose removing the wolf from the federal list of endangered species as soon as January, 2003. Before that can happen, however, all three states must have a management plan that ensures wolves won't once again become endangered. Montana began its process for producing a plan earlier this year and aims to have it in place by December. To learn more about opportunities for public comment and involvement, visit Montana FWP's web site, www.fwp.state.mt.us, and click the Montana wolf management link.

DENVER BRYAN

"LONELY TRAVELLER" © 2 [illegible] LUKE MAZUR. COURTESY OF THE GREENWICH WORKSHOP, INC., WWW.GREENWICHWORKSHOP.COM



The Grizzly of Falls Creek

Myth meets reality on the Rocky Mountain Front

BY BEN LONG

MONTANA OUTDOORS MA

Bill Mosher rode his cattle ranch on the modern equivalent of a trusty steed—a four-wheel-drive all-terrain vehicle. Behind him sat Montana Fish, Wildlife & Parks grizzly bear biologist Mike Madel, who jounced uncomfortably as the ATV's chubby tires tumbled over rocks, ruts, and badger holes.

That autumn day in 1992, Mosher and Madel were riding along the upper Dearborn River southwest of Augusta, investigating the killing of one of Mosher's calves. After surveying the kill site with Jim Stevens, a trapper with the U.S. Department of Agriculture (USDA) Animal Control Program, they pieced the story together. The cows and calves had been feeding among lodgepole pine and aspen. A large male grizzly approached over a small rise, walking toward the stock until they spooked. One panicked calf plowed into a tree. The bear was on the calf in seconds, killing it with a bite to the neck.

MONTANA OUTDOORS

After Madel and Stevens set cable foot snares around the carcass, Mosher and Madel headed back toward ranch headquarters aboard the four-wheeler. Suddenly, Mosher skidded to a halt.

Ahead of them was the grizzly, sprinting away. Its glossy, chocolate brown coat rippled over a muscular, dark hump and powerful hindquarters. Now and again, the bear looked over its shoulder.

"He ran like he expected us to start shooting at him at any moment. You could almost read the expression on his face," Madel says. "It was like '*Uh oh, they almost caught me.*'"

That was one of the few glimpses Mike Madel ever caught of the Falls Creek male in the wild. Little did he know how intertwined his life would become with that of the grizzly—a bear destined to become a Montana legend.

Ben Long of Kalispell is the author of Great Montana Bear Stories *(Riverbend Publishing).*

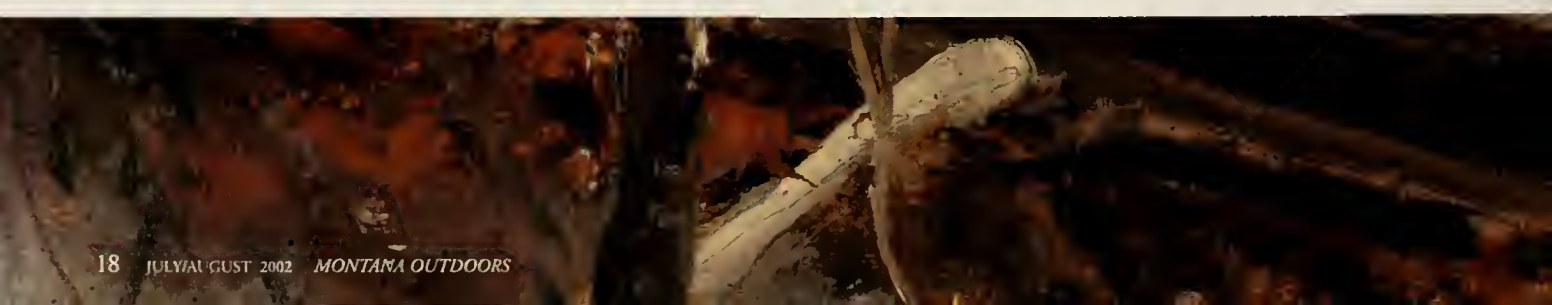
The history of Montana—and of the entire American West—is full of legendary, stock-killing bears. In the 1890s, a grizzly named Two Toes roamed Swan Valley, gobbling up a small fortune in livestock before being hunted down. A pig-killer dubbed Old Terror roamed the Cabinet Mountains around 1900. Hunters reported firing 40 shots at Old Terror at close range. Journalists of the day credited the bear's survival to its supernatural toughness, though in all likelihood it was due to the hunters' poor marksmanship.

In an earlier era, the Falls Creek male could have become a similar legend: a full-blown, rip-snortin' skull-smashin' renegade, come down from the mountains to deliver holy hell on honest ranchers. But times had changed in Montana. Unlike other states, where people simply exterminated grizzly bears in places wherever the large predators killed livestock, Montana set a different goal in 1923 by defining the grizzly as a game species. Since then, the state has conserved the great bear while raising livestock on the same landscape.

Toward that end, Madel's job is to help smooth the sometimes stormy relations between the Rocky Mountain Front's ranchers and its grizzly bears. In essence, Madel is a problem-solver. When a bear smashes up commercial beehives, the FWP bear biologist helps the beekeeper erect an electric fence around the remaining hives. When livestock die naturally—say, during spring calving season—the carcasses will often lure bears out of the mountains and into trouble among the ranches. Madel and other FWP biologists collect the carcasses and redistribute them into remote areas.

Most grizzly bears, Madel says, prefer safer foods—such as plant roots and berries—to livestock. "With cattle, there's substantial risk involved for the bear," he explains. "Mother cows are good at protecting calves. I've watched cows rush toward both bears and wolves, driving them away from their calves."

Imagine you're a curious, young, 150-pound grizzly,



approaching a cow and her calf. Suddenly the half-ton beast charges, ready to kick your fuzzy fanny back to the mountains. Most bears facing that once or twice learn to leave cows alone. Meanwhile, says Madel, most Rocky Mountain Front ranchers will tolerate occasional grizzly bears if the predators don't cause costly depredations.

Over the decades, Montana's grizzly management strategy has worked well. The state contains the largest grizzly population in the contiguous United States, and statewide livestock losses remain at levels acceptable to most ranchers. Part of that success is due to ongoing research that helps scientists learn about bear behavior and movement. For instance, in the 1980s FWP biologist Keith Aune conducted radio telemetry research on Rocky Mountain Front grizzlies, learning the bears' habits in an area primarily dedicated to ranching and farming. In May of 1985, he knew that a pair of grizzlies—a male and a female—was roaming near the Cuniff Creek area. It was breeding season, and the two were getting to know each other. In a patch of aspen, Aune carefully hid a foot snare, baited with meat. The male explored the bait but was too cagey to take it.

The female was not so cautious, however, and Aune nabbed her in a snare. After tranquilizing the three-year-old and taking her measurements, the research biologist also took from the trap site a sample of mud saturated with her urine. Aune used the pheromone-scented mudball as bait, and a few days later the male fell for it. Aune found the six-year-old grizzly securely held in a snare. After tranquilizing him, the research biologist fitted the bear with a radio collar, and, as he did the female, took measurements and tattooed an identification number on the animal's gums. The male received the number 346. Later, he would also be known as the Falls Creek male.

These two particular bears did indeed kill cattle, the female in particular. Three times she killed stock, and three times state wildlife biologists caught her afterwards and hauled her into the mountains. But each time she returned to ranches and killed more livestock. Eventually, authorities determined the bear had to be eliminated. In 1988, a Montana hunter killed her in a tightly supervised hunt.

Meanwhile, following radio transmissions from the bear's collar, biologists traced No. 346's home range over 175 square miles around a prominent, north-south escarpment called Falls Creek Ridge. Mostly, the Falls Creek male stayed in the mountains, deep within the Scapegoat Wilderness, feeding on biscuitroot and other plants.

By autumn 1985 No. 346 had dropped his radio, preventing biologists from following his daily movements. But every so often, Madel would receive a call from a rancher who had found a calf or yearling that had been killed the previous night and wanted the biologist to investigate. Often, Madel figured it had to be No. 346, because the tracks were the same width—6¼ inches—as those of the Falls Creek male.

"It's not like he killed calves every year," says Madel. "But every other year or so I would get another call." (Madel notes that each year only three or four calves are documented as having been killed by grizzlies on the Rocky Mountain Front south of the Blackfoot Reservation. That's in an area covering more than 1,800 square miles, where thousands of cattle range.)

"The ranch manager scrambled out of his truck and, from about 50 yards away, blasted two cracker shells at the bear."

When a rancher reports a fresh kill, a FWP biologist and USDA trapper investigate the kill site. If they agree the culprit is a grizzly, they set snares or culvert traps. Once captured, the bear is then relocated or, if it has been particularly troublesome, killed. During the 1980s, several marauding grizzlies along the Rocky Mountain Front got caught, but not bear No. 346.

Throughout the rest of the 1980s and the '90s, an average of roughly one cow, yearling, or calf was killed in No. 346's home range each year. Ranchers increasingly attributed those kills to the Falls Creek male. In 2001 Tim Tew, manager of the LF Ranch, north of Augusta, told a newspaper reporter that over the previous 13 years No. 346 had cost him thousands of dollars a year in lost beef. Bill Mosher told a reporter he had lost at least 21 head to that one grizzly. A USDA official credited the Falls Creek bear with killing some $200,000 worth of beef. (The conservation group Defenders of Wildlife reimbursed ranchers for verified stock lost to bears, which helped take some sting out of the depredations.)

Those large depredation figures are the ranchers'. The biologists have their own. While conceding that roughly one-third of the cattle killed by bears are never found or cannot be confirmed, Madel credits the Falls Creek male with killing a total of 21 calves, 5 yearlings, and 1 cow. If all those animals had made it to market, he says, their total value would have been about $16,600. That's no small loss, but it's less than one-tenth of the figure trumpeted in the press.

Aune, Madel's bear research colleague, contends that media accounts of the Falls Creek male made the grizzly larger than life. "That bear became mythologized," says Aune. "It became *the* bear of that country. People lost sight of the fact that there were other bears there, including other big males that we know occasionally killed livestock. Everything got pinned on [No.] 346."

Though biologists maintain that the Falls Creek grizzly didn't kill nearly as much livestock as reported, the bear did add to its notoriety by eluding capture for more than a decade. The rules of the federal Endangered Species Act prevented trappers from pursuing No. 346 on the Lewis and Clark National Forest. But whenever the bear killed on a private ranch, trappers did their best to nab it. The bear always got away. "We just couldn't catch him," Madel says. "There were many, many attempts. Whenever anyone would [set traps on a] kill site, the bear would just leave and not return."

By 2001 the Falls Creek male was growing old—about 22 years, biologists estimated—and much less wary. In late April of that year, cows were calving on the LF Ranch. Though it was nearly Easter, snow covered the ground and bitter winds blew off the mountains. Tew herded the pregnant cows into the protection of a cottonwood creek bottom. On Good Friday morning, he found three slain calves, evidentally killed by a bear. He called Madel, who set traps near the kill site and gave Tew a supply of noise-making "cracker shells" for the ranch manager's shotgun.

The next day Tew found another dead calf—along with big grizzly tracks. The cattle, too frightened to remain in the cottonwood bottom, moved up to the exposed slopes, where Tew feared the newborn calves risked hypothermia.

Later that day, while tending to his herd, Tew saw a big, dark grizzly eyeing a calf. The ranch manager scrambled out of his truck and, from about 50 yards away, blasted two cracker shells at the bear. Not until he fired a third round did the bear finally turn to leave.

Cautiously, they approached the still form. Certain it was unconscious, Madel lifted the bear's lip.

On Easter Sunday, federal trappers set two foot snares and a culvert trap on the LF Ranch. By the following day the bear had killed two more calves. The baited traps were untouched.

Bears weren't the only predators on the LF Ranch. Coyotes had been hanging around the calving area, attracted to the smell of afterbirth. On Tuesday federal animal control specialists flew over the area, shooting coyotes out of a helicopter while Madel inspected the bear traps he'd set previously. On one flight, the gunner spotted the tracks of a grizzly leading into a timbered ridge.

At this stage, no one knew if this bear was a repeat stock-killer, which might need to be dispatched, or one experimenting around cattle for the first time, which would only be captured and moved elsewhere. So the gunner traded his shotgun for a dart gun, loaded with immobilizing drugs. While Madel waited on the ground, the federal pilot skimmed low over the piney ridge and spotted the bear below. He banked and flew in closer, giving his gunner

a clearer shot. The dart struck the bear in the rump. Getting a call from the plane, Madel and others scrambled to the scene, where they gave the groggy bear another dose of immobilizing drugs. Cautiously, they approached the still form. Certain it was unconscious, Madel lifted the bear's lip. There, faintly on the gum, was the number that Aune had tattooed 15 years before: 346. The Falls Creek male was finally in hand.

The grizzly weighed 595 pounds, about 150 less than he weighed in his prime. He was 21 years old, with teeth worn and decayed.

"There was a change, both in his movements and in his wariness around people," Madel says. As the bear's teeth became pitted and worn, it may have been more difficult for him to survive on plant food. Perhaps a tender young calf was just the protein bonus he was looking for. But no one knows exactly why some bears grow bolder as they grow older.

As the grizzly lay at their feet, the federal and state wildlife officials weighed No. 346's fate. Though a grizzly bear in the wild can live 30 years or more, many don't make it to 15. This animal was long past his prime—and it had repeatedly killed livestock. Madel hitched the culvert trap to his pickup truck and drove south to Bozeman. There, No. 346 was reunited with Aune, the man who first caught the bear in 1985. Using a hypodermic the size of a toothpaste tube, Aune gave the great bear one last, lethal injection.

When the bear was dead, reporters interviewed the ranchers, who agreed it was time for No. 346 to be destroyed. But the ranchers also said a part of them would miss the old cuss. "It's kind of sad," Tew said at the time. "That old bugger's been around a long time."

There was a time when grizzlies were to be exterminated, not conserved. But over the past 80 years, Montana has worked hard to keep grizzlies and ranchers on the same landscape. Times have changed. Yet the human tendency to seek out a single culprit for a complex problem has not. The Falls Creek grizzly became legendary, larger than life. In the human imagination, this one bear became the source of all the depredation across 175 square miles of the Rocky Mountain Front.

"It seems human nature to want to find some individual to take the blame," Aune says. "People think we can fix the problem simply by removing one bear. The truth is that when we pin the problems of cattle depredation on a single animal, we lose sight of

MIKE MADEL

the bigger picture of what is happening on the land. We miss the real message here. Some bears that have the opportunity to kill cows will take advantage of the opportunity. Killing one bear doesn't erase that picture."

And neither, adds Aune, will killing all bears. "This idea that we are going to totally eliminate conflicts is just inappropriate," he says. "It's just not going to happen. As long as we engage in human activity in grizzly bear habitat, there will be conflicts. We can minimize and mitigate conflicts, but that's about it. Of course, it's easy for me to say that. I don't have a lot of cows grazing in grizzly country on the Rocky Mountain Front."

And what of those who do? If grizzlies are allowed to roam cattle country, some will occasionally prey on livestock. The extent to which ranchers tolerate kills by future No. 346s—and how FWP manages those grizzlies—will likely determine the future of this great animal in the Front. Habitat, and our ability to share it, remains the key. ■

The Falls Creek grizzly is being mounted for display at the Boone and Crockett Club research center near Dupuyer.

HOPE FOR MONTANA'S

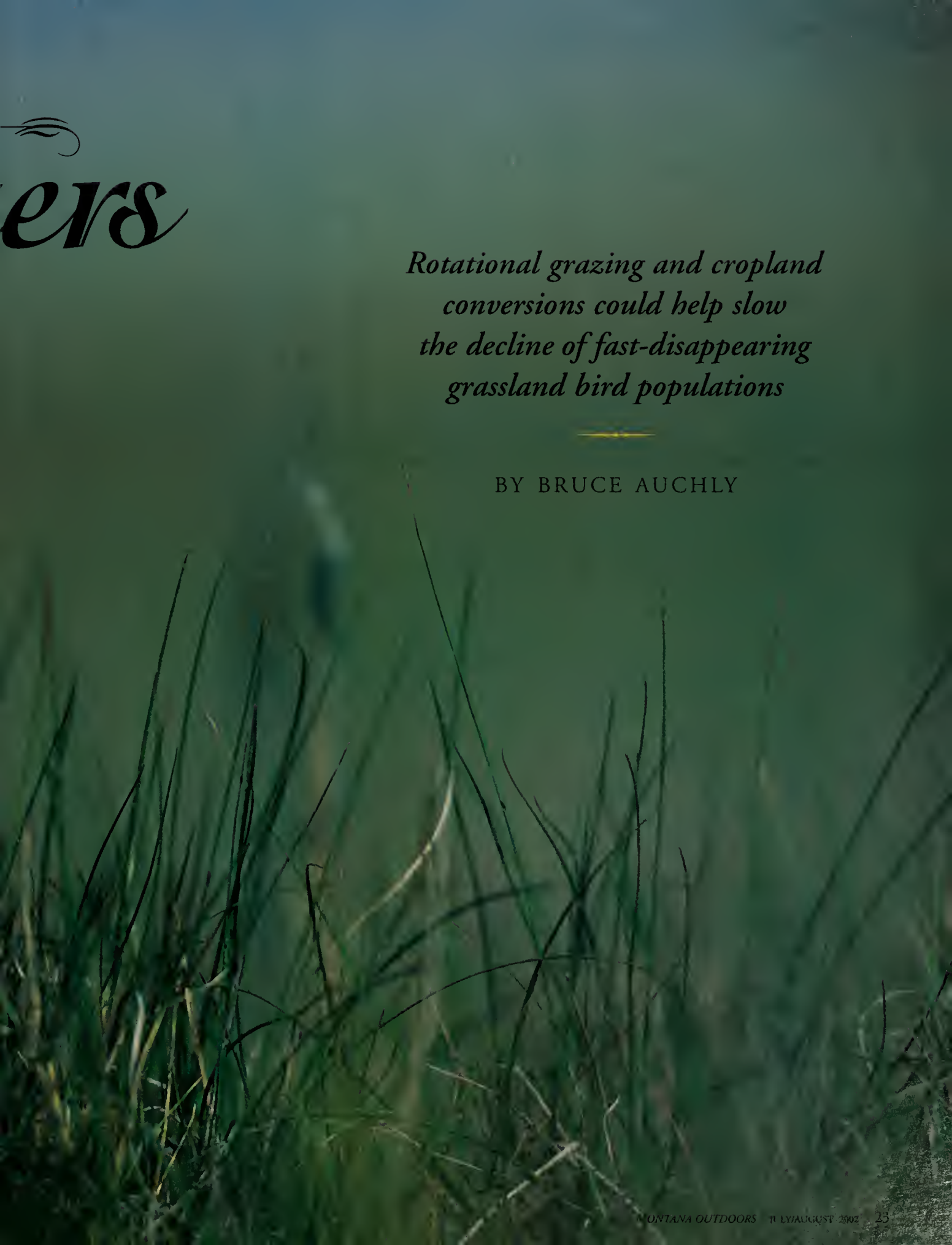
Prairie Songst

CHESTNUT-COLLARED LONGSPUR BY RICHARD HOUSE

ers

Rotational grazing and cropland conversions could help slow the decline of fast-disappearing grassland bird populations

BY BRUCE AUCHLY



Early some summer morning, pick a gravel road anywhere in north-central or eastern Montana and drive three miles north of nowhere. Turn off the engine. Soon you'll hear a prairie songbird chorus filled with shrill short notes, tiny sleigh bells, and pulsing trills, repeated over and over. Listen now, because the songbirds of the prairie are disappearing.

Since 1967 the North American Breeding Bird Survey (BBS) has documented the relative abundance of bird populations in Canada and the United States. From the beginning, BBS counts have indicated a long, continuous decline for many prairie bird populations, especially songbirds like the Baird's sparrow, Sprague's pipit, chestnut-collared longspur, and McCown's longspur. Numbers of other species, such as the ferruginous hawk and the burrowing owl, have dropped so precipitously they have become species of special concern in Montana. And then there is the oddly named mountain plover—a prairie shorebird that has become so rare it has been proposed for listing as threatened under the federal Endangered Species Act.

The culprit responsible for the disappearance of so many grassland birds? The plow. "Problem number one is the loss of native prairie," says John Carlson, a zoologist with the Montana Natural Heritage Program. Before European settlement, roughly 77 percent (72 million acres) of what is today Montana was not forested, according to Natural Heritage Program estimates. Most of that acreage was mixed grass prairie east of the Rockies, but it also included meadows west of the Continental Divide and the sagebrush-dominated steppe in eastern and southeastern Montana. The first large assault on this prairie sea occurred from 1900 to 1921, when Montana saw the arrival of nearly 200,000 homesteaders, many of whom turned grasslands into farm fields.

And sodbusting continues even today. From 1982 to 1997, 1.2 million acres of Montana's prairie were converted to cropland. That's an area about the size of a middling county like Judith Basin or Toole.

"With conversion to cropland," Carlson explains, "you totally eliminate the habitat for 99 percent of those prairie bird species."

Fortunately the picture of Montana's prairie birds is not as bleak as on the rest of the Great Plains. Rest-rotation grazing done by some ranching operations is reinvigorating large tracts of grasslands, while the federal Conservation Reserve Program pays farmers to convert erodible farmland to wildlife habitat made of native plant species. The results, say biologists, could stem the decline of some grassland bird populations in Montana.

Drab as a homesteader's cabin

Prairie songbirds are among the least-known and -studied birds in North America. That's not hard to figure. They nest far from population centers, in a region and climate most folks aren't eager to visit. And because many prairie songbirds are sparrow species, some people mistakenly equate them with the pesky house (English) sparrow. Another reason for prairie birds' obscurity is their color (or lack of). When these songbirds do show themselves above the short grasses of Montana's prairie, they are as drab as a homesteader's cabin, often marked only by furtive streaks of brown and white feathers. To most people, chestnut-collared longspurs, Sprague's pipits, and McCown's longspurs are simply "LBJs": little brown jobs.

That's not to say the plain-looking songsters don't have a fan or two. "The people who live out here in the plains just love these birds, even if they don't know their names," says Beth Madden, a federal wildlife biologist at Medicine Lake National Wildlife Refuge, located in Montana's northeastern corner. Prairie winters are long, and the barren landscape is frozen for much of the year. When prairie songbirds return in the spring and sing again, they represent to local residents a return of warmth and new life. "It adds to the quality of life," says Madden.

RICHARD MOUSEL

ALAN G. NELSON

DRAB AND DUBIOUS: One reason for grassland birds' obscurity is their lack of vibrant colors; most are as tan as the grass they live in. Another is the apparent similarity between native grassland birds, such as the McCown's longspur (above right) and the pesky English sparrow (above left). Finally, there's the fact that few people have ever heard of the Baird's sparrow, Sprague's pipit, mountain plover, or long-billed curlew (far right).

BRUCE AUC

OVERALL AGREEMENT: Wildlife biologists agree with ranchers, such as Henry Gordon of Chinook, that rotational cattle grazing can actually benefit grasslands.

Aside from their pretty spring melodies, however, prairie birds aren't highly valued. A common question posed to biologists is why something so seemingly insignificant is worth saving. Fortunately, even LBJs had an eloquent champion in Aldo Leopold, the renowned ecologist and founder of modern wildlife management. "The last word in ignorance," wrote Leopold, "is the man who says of an animal or plant: 'What good is it?' If the land mechanism as a whole is good, then every part is good, whether we understand it or not. If the biota, in the course of eons, has built something we like but do not understand, then who but a fool would discard seemingly useless parts?"

Modern ranchers, certainly no fools, may unwittingly be the best friends those little brown jobs have. Although a significant portion of Monrana's prairie has been plowed, the state has retained more than half of its native grasslands (roughly 40 million acres), much of it cattle pasture. Meanwhile, about 75 percent of the entire nation's mixed-grass prairie has disappeared. "Compared to Kansas and eastern Colorado we have a lot of intact habitat," says Carlson. "Our challenge is to keep it that way."

That's where ranchers come in. Ranchers, as well as wildlife biologists and range scientists, believe that the best use for Montana's remaining prairie is turning its grass inro beef. Because Montana's native grass prairie evolved with grazers, mainly bison, they contend that cattle ranching can actually conserve grass prairie habitat while providing a livelihood for ranchers.

"[Private] land has to produce an income," says Rick Northrup, a Montana FWP biologist at Malta. "And there are four ways to do that: lease land for someone's private hunting playground, small-grain farming, ranching, and, in some areas, subdividing [for commercial development]. For most of the public, ranching is the best oprion because it supports native wildlife and provides hunting opportunities. It also maintains the native setting and the aesthetics."

Ranchers, in other words, could actually help save Montana's prairie glee club.

Not that Henry Gordon of Chinook knows one prairie songbird from another. But the Chinook-area rancher does believe that ranching is a lot better for wildlife than farming has been.

"This land was never meant to be farmed," says Gordon, 52, whose grandfather homesteaded more than 100 years ago. The Gordon Cattle Company controls 60,000 acres, about half of it north of Chinook and the Milk River—thin-skinned land in a dry climate that never should have felt a plow.

"Cattle and wildlife are the only things this land is good for," Gordon says.

Prairie patchwork

To a large extent, wildlife biologists agree. Historically, the Great Plains exhibited a patchwork of prairie reflecting a variety of grazing patterns. For example, Lewis and Clark reported a carpet of prickly pear cactus around what is today Great Falls, apparently due to bison overgrazing the area. Meanwhile, other portions of the prairie were hardly grazed for years, and others were scorched by prairie fires.

Today, wildlife biologists encourage ranchers to employ a practice called rest-rotation grazing, by which some pastures are rested while others are temporarily grazed. The result is a diversity of grass heights that support a wide range of wildlife species.

Prairie grass evolved with grazing bison. When cropped, the plants put energy into roots and the remaining top growth, which concentrates nutrients. Hoofed animals also help break up the soil and dead grass while spreading seeds.

Traditional cattle grazing management

DONALD M JONES

ALAN G. NELSON

WHEAT OR CATTLE? Farming destroys prairie songbird habitat because it replaces native grasses with row crops. Rotational cattle grazing, however, can actually benefit grassland habitats by mimicking the historical cropping by bison, creating the diversity of grass lengths needed by various bird species.

does clip prairie grass short, but too often it also creates a monoculture of uniform grass height. That lack of diversity, says Carlson, robs many wildlife species of their unique habitat. "These grassland birds evolved in a system where nothing was the same over 20 miles, 40 miles," he says. "You had grass that was beaten down to nothing, grass that was left alone, grass that was burned, and grass that was in good shape."

Different prairie birds take advantage of varying grass heights and conditions. McCown's longspurs, for example, put their nests in sparse plant cover. Baird's sparrows, on the other hand, need overhanging vegetation for nesting and will abandon an area if the surrounding grass gets grazed too much. Mountain plovers make their nests in short, sparse vegetation—even bare ground. Burrowing owls use a mixture. They nest in burrows of prairie dog towns, where the surrounding barren ground lets them see predators more easily. To find food, however, the little owls head to dense vegetation, at least 12 inches tall, which holds insects and small mammals.

To help ranchers maintain or improve grazing programs that produce a diverse prairie landscape, FWP and other agencies and organizations offer conservation easements. Landowners are paid to give up certain rights, like subdividing, sodbusting, and surface mining. In return, they agree to conserve land and wildlife habitat in order to maintain a healthy range and watershed. FWP has about 250,000 acres under conservation easements—mostly for elk and deer habitat. Roughly one-fifth of that, or 50,000 acres, is classified as sagebrush-grassland.

"The best thing FWP has going for grassland birds is the department's conservation easement program," Carlson says. "Even when it's intended for conserving big game habitat, it does good things for other species."

Northrup, the FWP biologist, has helped oversee three grants through the North American Wetlands Conservation Act. The most recent project combined $1 million from NAWCA and $2.7 million of money and in-kind contributions from the Fort Peck Sioux and Assiniboine tribes, five government agencies, and seven private groups.

"That money will go to protecting and establishing wetlands," Northrup says, "and to grassland and wetland conservation easements that will protect those places from tillage and draining." He adds that the easements will allow for traditional ranching uses such as grazing and haying, but only after July 15, when most grassland birds have finished nesting.

Less erosion, more wildlife

Conservation easements keep the plow off the prairie. But what about a prairie already turned upside down?

So far, the best attempt to restore cropland to grassland has been the federal Conservation Reserve Program. It began in 1986 with the U.S. Department of Agriculture paying farmers to take erodible, marginally productive farm land out of production. The goal: raise grain prices while reducing soil erosion.

Though still reducing grain gluts and

ALAN G. NELSON

Bruce Auchly, an FWP information officer at Great Falls, is a frequent contributor to Montana Outdoors.

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soil loss, CRP has been revised in recent years to focus more on benefiting wildlife and water quality. Farmers bid their fields on a point system—the more points, the better the chance a particular field will qualify for enrollment. Points are given for using legumes and native seed mixtures beneficial to wildlife, such as those that provide nesting and sheltering cover and restore rare and declining native grassland habitat. Additional points are given for establishing food plots.

Arlo Skari has about 1,000 of his farm's 7,000 acres in CRP and other conservation plantings. The Skari farm lies north of U.S. Highway 2 between Chester and the Sweet Grass Hills. It's inside the Golden Triangle formed by Cut Bank, Great Falls, and Havre, a region named for its productive wheat fields. Eighty years after the end of the homestead era, abandoned cabins still litter the landscape. The scars on the land from eight decades of intensive farming are slow to heal, too. Skari came to farm this fertile land in 1947 as a young man and, over the years, cultivated increasing acres as he expanded his holdings. Then, 15 years ago, he stopped.

"I felt it was not needed," Skari says. "The country was awash in wheat and we needed the preservation of native plant species."

The Skari farm, now managed by his son, is a model of land conservation and agricultural economics. Yet looking back on a life well spent, Skari wonders if he and his neighbors might have left more land unplowed.

"Stepping back and looking at the big picture," Skari says of the prairie, "it never should have been broken out. I think it would have been better if it would have been left in ranching."

Skari lives far out on the prairie, almost 14 miles from the pavement. Stretching to the horizon are acres and acres of wheat and barley along with an occasional field planted back to native grasses. Off to the side of the road, out of the vegetation, a small drab bird takes off, flying skyward to 100 yards. At its zenith it circles and then begins a long glide while singing a 12-note melody of jingling, metallic sounds. After several bouts of song, the bird drops into the grass and disappears.

Was it ever really there at all? ■

ALAN G. NELSON

HAWKS AND SPARROWS: Ferruginous hawks thrive in native grasslands, where they prey on gophers, prairie dogs, and ground squirrels. The same habitat is required by grasshopper sparrows and other prairie songsters.

How's the Fishery?

The new head of FWP's Fisheries Division talks candidly about the current state of fisheries management in Montana.

Last November Chris Hunter, a 12-year agency veteran, was named administrator of Montana FWP's Fisheries Division. Hunter, 51, had been the assistant Fisheries Division administrator, a position he had held since 1999. He replaced Larry Peterman, who had been promoted to FWP chief of operations in September.

Hunter holds a master's degree in zoology from the University of Montana. He began his career with FWP in 1989 as the Lower Missouri River Reservation biologist. In 1990 Hunter was named chief of the agency's Special Projects Bureau. During 1991 he served as president of the Montana Chapter of the American Fisheries Society. Though fluent in all dialects of fisheries management, Hunter's main expertise is in native fish, hydropower relicensing, and stream restoration.

Montana Outdoors recently interviewed Hunter to learn more about him and the future of fisheries management in Montana.

For nearly a decade you were chief of the Fisheries Division's Special Projects Bureau. What did you work on?

Mainly native fish species—particularly Arctic grayling, bull trout, pallid sturgeon. And I was heavily into dam relicensing. For dam operators to get relicensed by the Federal Energy Regulatory Commission, they have to show they're doing things good for the river and agree to mitigate [do or pay something in compensation for] the harm the dams do to water flows and fish populations.

That sounds...controversial. How did it get handled?

I learned there are two ways industry can do business with us. There's the old, slow, adversarial way, which is what we've seen on several dams over the past 20 years. At the other end of the spectrum, however, was the Avista Company, which has dams on the lower Clark Fork. That company gets it. They were real committed to getting the relicensing done in cooperation with the community affected by their dams.

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How so?

What Avista did that worked so well is they brought in all the interests, and I mean all. In the mid-1990s, they established a consensus group of 40 people representing anglers, county commissioners, landowners, environmentalists—the whole nine yards. Eventually they came up with a win-win solution, where the company got relicensed in record time and the others got the mitigation they wanted for the fish resource and recreation. I honestly didn't think it could be done, that they could find some agreement among those diverse interests. But it happened. And it happened because Avista wanted it to happen.

Has that experience influenced your management style?

It has. For example, we used that same collaborative process for developing our westslope cutthroat trout plan. We invited anyone who was interested, anyone who might be affected, and asked them to sit down and advise us on writing the plan. I really think that by collaborating with other agencies, with landowners, with interest groups, and with regular citizens, we are going to make this work. If we are to realize any vision for fisheries management in this state, we have to work with all the other players—the Bureau of Land Management, the U.S. Fish and Wildlife Service, the U.S. Forest Service, the various Indian tribes, and all the important conservation groups such as Walleye Unlimited, Trout Unlimited, and the Montana Wildlife Federation.

You mentioned vision. What *is* the agency's vision for fisheries management?

Basically it's two things. One, preserve and protect native fisheries. Two, provide a diversity of recreational opportunities for anglers.

Don't the two goals conflict?

Sometimes. For example, on Flathead Lake we can't provide full recreational and commercial fishing opportunities for lake trout and whitefish while at the same time protecting native bull trout and cutthroat. Something has to give a bit. Those are the hardest challenges to face.

So what do you do?

Well, on Flathead we worked with the Confederated Salish and Kootenai tribes, which co-manage the lake with us, to develop a management plan that—once again—was a collaborative process, involving the tribes, guides, lakeshore residents, local anglers, and a commercial fisherman. Not everyone was completely happy—which would have been pretty much impossible—but the final plan was one that protects the native fishery resources, provides for sport and commercial fishing interests, and is supported by all parties.

No one party gets everything it wants, but everyone at least gets something?

Right.

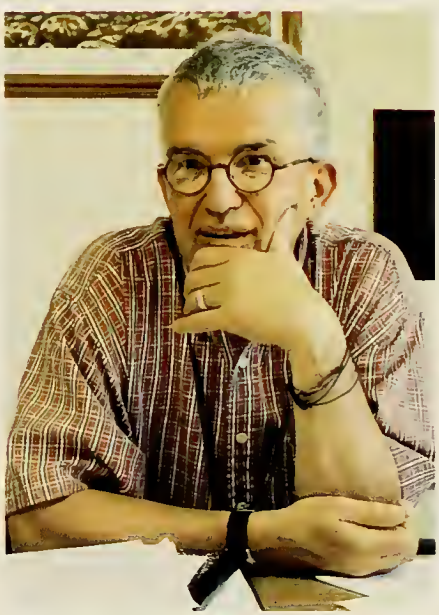
Isn't that setting the bar a bit low?

Actually, just the opposite. It's a very high standard because it's extremely difficult to achieve consensus. The other day I saw a bumper sticker that said "Everything. All the Time." You know what? That's just not going to happen—at least not when it comes to Montana's fisheries. Everyone can't have everything they want all the time. It's impossible. So what we try to do with fisheries management in Montana is strike a reasonable and fair balance, of protecting and preserving our fishery resources, providing recreational opportunities, and meeting the needs and desires of the public.

What other big fisheries management issues are going on now?

One is at Fort Peck Lake. The issue there is that some angling groups want us to stock more walleyes so they can have higher catch rates—rates we just don't think are sustainable. So we've come up with a management plan that has reasonable catch rates but also has other goals such as increasing the average size of walleyes that anglers catch. We're hoping it strikes that reasonable balance I was talking about earlier. One of the big problems at Fort Peck is that the economy there is in tough shape. So it's not just recreation we're talking about but also the economy associated with fishing. That's really important to people in those areas. And we can't take those concerns lightly.

Flathead Lake, the Beaverhead-Big Hole, the Smith.... So many fisheries issues seem to be centered more on economic and social concerns than on biology. How do you handle that? What sort of expertise does FWP have in those fields?



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It's tough. All our fisheries biologists have graduate degrees in fisheries, and our Fisheries Division is a national leader in progressive fisheries management. But we don't get much training in community relations or sociology. Then we ask our biologists to solve difficult social issues. It isn't fair to them or the public. I think that's an area where we really need to focus on improving—how we listen to the public and how we communicate with the public. One encouraging sign is that the department recently hired a river recreation management specialist to work on these issues, which should help a lot.

You've spent a good part of your career promoting and managing Montana's native fish species. What are the issues there?

Well for one thing, just getting people to understand the difference between a native and nonnative fish is a big step. We recently did a survey and found that two out of three people incorrectly believe the rainbow trout is native to Montana. That shows we need to do some work on education. But at the same time, most people know that bull trout and westslope cutthroats are natives, which is good news. And we found strong support for conserving native fish. We're lucky that most of the native fish we're working on are sport fish, such as cutthroats, pallid sturgeon, and sauger. Anglers have a high regard for those species. It's a lot harder with a nongame fish like a stonecat.

The biggest issue for us is in restoration, especially when you have to remove a nonnative to restore a native. Take the controversy over the Cherry Creek restoration, in which we plan to remove brook trout and stock native westslope cutthroats. That has been real contentious, although I think Cherry Creek is not a good example because much of the opposition has been more focused on the landowner, Ted Turner, than on the project itself.

Even if Cherry Creek isn't the best example, it does bring up an important question: How does FWP balance the rights of anglers accustomed to a certain fishing opportunity with the rights of those—anglers and nonanglers—who want you to restore native fish species?

First we have to be selective about where we attempt to restore native fish. There seems to be a misconception that we want to restore westslope cutthroats and other natives everywhere. It's just not true. For one thing, it's not even possible. For instance, there's no way we could remove

"The possible removal of the Milltown Dam and the potential for restoring the Blackfoot and Clark Fork rivers is about the most exciting fisheries news in my memory."

browns and rainbows from the Madison and restore it to cutthroat and grayling even if we wanted to. And we don't want to.

But aren't you doing some cutthroat restorations on the Madison?

We are on some tributaries of the Madison that browns are not using for spawning, and we're hoping some cutts will trickle down into the Madison and provide some additional angling opportunity.

Warmwater species, particularly the walleye, are attracting a big following. What's FWP doing on warmwater management?

One of the most important things we do is conduct lake surveys to keep track of walleye populations and then try to get that information out to anglers so they know what to expect. For example, if we see a big year-class coming through the system and can tell anglers that they'll be catching a lot of little 12-inch walleyes next year, but not to worry because those fish will be decent-sized 16-inchers in a few more years—and that in fact is what happens—then anglers start to have more faith in the work we do.

We appear to be in the fourth consecutive year of a drought. How will that affect your management priorities?

The drought is huge, absolutely huge. We're seeing impacts everywhere. On reservoirs, many boat ramps are completely inaccessible because the water is 200, 300 yards from the ramp. Some reservoirs, like Clark Canyon and Fresno, are puddles. Even Fort Peck is way down, to where it was in the early 1990s.

For coldwater fisheries it's even worse. There is a good chance we'll be closing the Big Hole, the Beaverhead, and the Jefferson again this year the way things are going. And we'll probably need to have the "hoot owl" closure on the Missouri, when we close fishing at noon and open it at midnight.

That's all a bit depressing. Any good news to report?

Oh yes. There really are so many great things going on, like our native fish restoration work, our continued success

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managing wild trout, and our Fishing Access Site Program, which so far has created over 320 fishing sites throughout the state. There's also the possible removal of the Milltown Dam, which, with the potential for restoring the Blackfoot and Clark Fork rivers, is about the most exciting fisheries news in my memory.

I'm also really excited about the potential of the Natural Resources Damages Program and the money that will soon be available for some major restoration work.

Not the most exciting name for a program. What's it about?

The state of Montana filed suit against Arco for all the historic environmental damages done at the Anaconda smelter. The lawsuit has been ongoing a long time, and so far the partial settlement has freed up a fair amount of money to go to environmental restoration. We're hoping the entire suit will be settled in the next three years, and there should be a substantial settlement for restoring the upper Clark Fork. And there are tremendous opportunities for other river and stream restorations over the next 20 years.

Then there are the mitigation dollars resulting from the hydropower relicensing on the Madison, Missouri, and Clark Fork rivers from PPL Montana and Avista. For example, money from Avista will go to improve habitat on the tributaries of the lower Clark Fork and find ways to allow bull trout and cutts to move around the dam.

So much water to manage, so many issues to address. Do you have any time to fish Montana's rivers and lakes?

Always. Now that our kids are off to college, my wife and I have more time to hike, backpack, canoe, kayak, fish. I'm hoping that in this job I will make lots of new friends who want to take me fishing. I'd really like to learn to catch shovelnose sturgeon. They're very abundant, we have the biggest shovelnose in the Missouri River system, and sturgeon are great eating. ■

THE GREATEST FISH YOU'VE NEVER SEEN

A look at some fascinating though little-known species

WRITTEN BY TOM DICKSON
ILLUSTRATIONS BY JOSEPH TOMELLERI

FISH INTRIGUE ME. I'M AWED BY THEIR SLEEK SHAPES, colorful variations, patterned scales. Even more, I'm drawn to their mysterious allure. Scientists, who have scrutinized every gland and gesture of mule deer and mallards, know surprisingly little about the state's finned fauna. And no wonder. Beneath the dark surface of rivers and reservoirs swims a world few people can ever see, much less study.

Sure, anglers know about game fish—trout, walleyes, and the dozen or so other varieties sought for flesh and fight. But the majority of Montana's 84 species, ignobly named "forage fish" or "rough fish," remain unnoticed beneath the hulls of passing boats.

These rarely seen creatures range in size from tiny darters smaller than your pinkie to white sturgeons big as a park bench. Some are drab colored, like the washed-olive smallmouth buffalo; others, like the Iowa darter, dazzle the eye with their spawning colors.

Collected here are several little-known native fish I find particularly fascinating. A few are visually stunning. Others behave extraordinarily. All of them, combined with the state's other fish species, make up a large portion of Montana's extensive underwater ecosystems.

White Sturgeon

Montana is fortunate to be home to three fascinating sturgeon species—the white, the pallid, and the shovelnose. All three look like a sucker-shark hybrid (if such a thing were possible). A sturgeon's long, rubbery snout is shaped like a bullet. Its suckerlike mouth projects down from the underside of its snout and, like a vacuum tube, sucks crayfish, nymphs, and other small aquatic animals the fish eats.

All sturgeons have a long, cylindrical body that ends in a sharklike tail. And, like a shark, the sturgeon is a prehistoric fish. Modern specimens look exactly like those in 100-million-year-old fossils.

The name sturgeon comes from a Germanic root meaning "to stir" or "to poke around," referring to the way the fish stirs up river bottoms when feeding.

Though all sturgeon species are remarkable creatures, it's the white that most captures the imagination. For one thing, it is the largest freshwater fish in North America. The species ranges from Alaska to southern California, and specimens caught in the early 1900s weighed more than 1,500 pounds and measured over 15 feet long (Montana's state record, however, was a relatively small 96-pounder caught in 1968).

For another, Montana contains the only naturally land-locked population of white sturgeon. This sub-population of white sturgeon is found only in 168 miles of the Kootenai River from Kootenai Falls, 31 miles downstream of Libby, north to Kootenay Lake in British Columbia. Scientists believe this population was cut off from the rest of the Columbia River drainage by glaciation

White Sturgeon

10,000 years ago. That formed the falls, which prevented white sturgeon—an anadromous species that ordinarily lives part of its life in the Pacific Ocean—from moving downstream to the Columbia River.

Water pollution in the 1950s and '60s caused the white sturgeon population to decline, but what really hurt the fish was the construction of the Libby Dam in 1975. This altered historical water level regimes needed for sturgeon spawning, blocked their upstream movement, and trapped nutrients that previously had fed the ecosystem downstream. So low did the population drop that it was put on the federal endangered species list in 1974.

Burbot

The burbot—also known as ling, ling cod, and lawyer—can't forget it's the only freshwatet member of the cod family. This close relative of Atlantic cod, haddock, and pollock is one of the few freshwater fishes to spawn in winter—the same time ocean cod spawn in the Atlantic Ocean.

The catfish-shaped burbot is marked by a single barbel on its chin and a mottled pattern of brown blotches on a yellow background. Slow for a fish, the burbot uses its camouflage to dupe minnows into swimming within striking distance.

Though considered a game fish, the burbot is often disdained by anglers put off by the fish's habit of wrapping itself around their arm like an eel as they try to remove the hook. One friend refers to burbot as the "ish of fish."

Seen only by a few biologists and ice anglers, the burbots' spawning ritual is almost mythical. In early February, they move from the depths of rivers and reservoirs to shallow water over mud flats or sandy shoals. The snakelike fish then congregate in a living glob of from a dozen to a hundred or more intertwined bodies that move in and out of the quivering sphere, releasing eggs and spawn.

Noted north woods author and naturalist Sigurd E. Olson once witnessed burbot spawning through an opening in the ice and described the spectacle: "We...saw such a sight as few have ever seen—a struggling, squirming mass of fish, the long brownish snaky bodies twisting around each other, the entire contorted mass turning over and over, beating the water into a foam."

Burbot are primarily fish of northern waters—including those of Europe—though some occasionally turn up as far south as Missouri. Most swim in clean, deep lakes and rivers. Scientists have found them as deep as 1,000 feet in Lake Superior.

Like that of the cod, the burbot's liver is rich in vitamins A and D. French connoisseurs prize the *foie de lotte de rivière* (liver of the river cod), either poached in white wine or made into pâté or canapés. The meat is codlike, too—white and bone-free.

Mottled Sculpin

This little fish, which looks like a cartoon bullhead, is well known to fly anglers, who use deer-hair-and-feather imitations (such as the Muddler Minnow and Marabou Muddler) to catch trout.

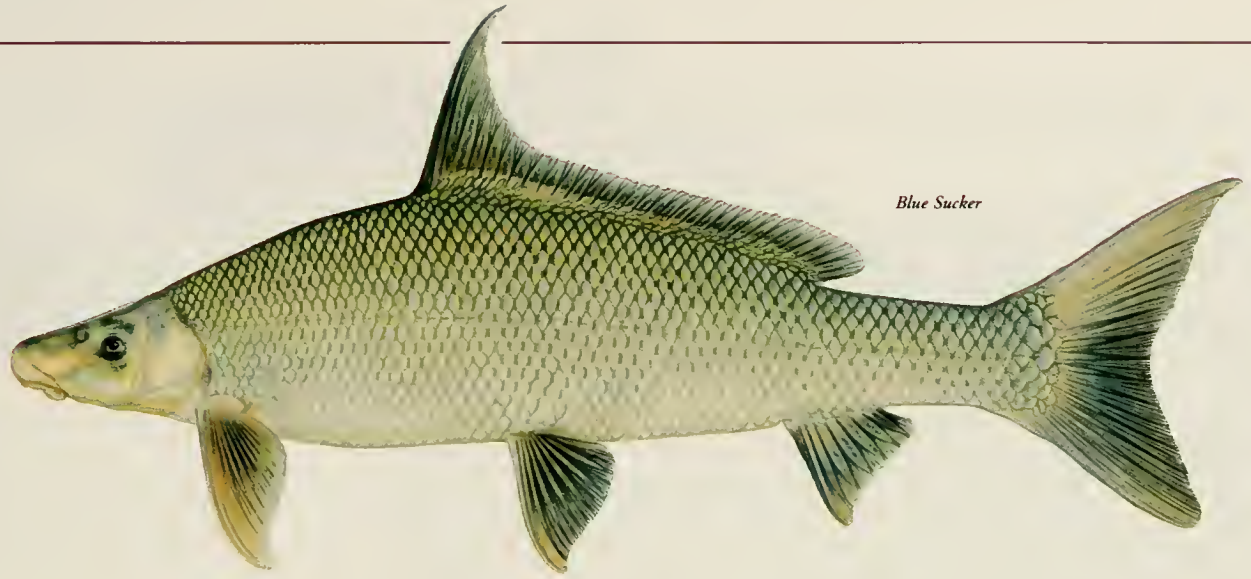
Mottled Sculpin

The mottled sculpin's scientific name, *Cottus bairdi*, comes from the Latin word for fish and S.F. Baird, who headed the U.S. Fish Commission in the late 1800s. Like its nearly similar-looking Montana cousins—the spiny, shorthead, torrent, and spoonhead sculpins—the mottled has an oversized head that tapers down to a small body and tail. Adult mottled sculpins average about 3 to 4 inches long, though some monsters over 6 inches have been reported.

In Montana, mottled sculpins are found primarily in clear, fast-flowing mountain streams in the Missouri, Saskatchewan, and Yellowstone river drainages. They live in riffles, feeding on

Burbot

Tom Dickson is editor of Montana Outdoors *and co-author of* Fishing for Buffalo *(a guide to the sport and cuisine of gar, burbot, drum, and other so-called roughfish). Missouri artist Joseph Tomelleri is considered one of the world's best fish illustrators.*



Blue Sucker

midge and caddis fly larvae and also trout eggs and fry, though not to the point where trout populations are harmed.

Mountain Whitefish

The strike indicator pauses, up goes the rod tip, and now you're directly hooked to 18 inches of muscular mountain whitefish roaring downstream.

Related to trout, salmon, char, and grayling, the mountain whitefish is one of three whitefish species (lake and pygmy whitefish are the others) that swim in Montana waters.

Like the trout that inhabit the same streams and rivers, the mountain whitefish has a long, muscular body that ends in a small head. Unlike trout, however, the whitefish has a lipped mouth, which it uses to slurp up midge and caddis fly larvae from the river bottom. Because of its mouth, many anglers mistake the whitefish for a type of sucker.

Mountain whitefish are found on either side of the Continental Divide. They stick mainly to clean rivers, and their presence indicates good water quality. Conversely, their disappearance warns of water pollution.

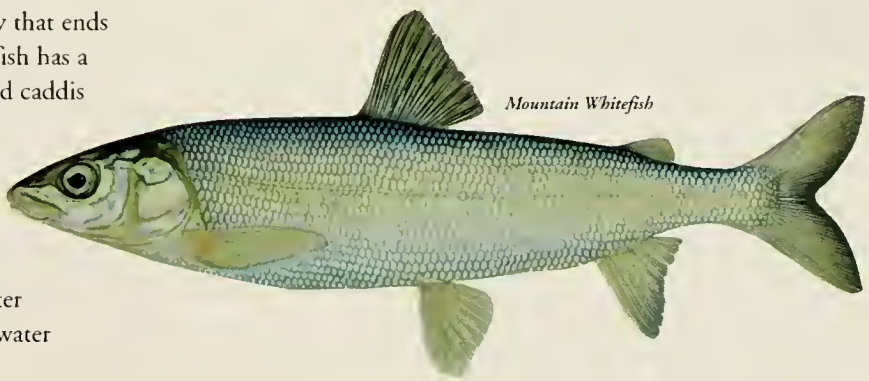
Some anglers express disappointment to learn they've hooked this common river fish rather than a trout—apparently because whitefish take bait and lures more readily than trout do and are thus less of a challenge. Yet the whitefish fights hard, grows to over 3 pounds, and in swift current can take a fly line into its backing.

Blue Sucker

Here is an aristocrat among warmwater fish. With its elegant shape, striking coloration, and acute sensitivity to pollution, the blue sucker seems more like a trout than a sucker. But sucker it is—one of nine species in Montana.

Like all suckers, the blue is named for the toothless, lipped mouth it uses to pick up food. In clean, fast-flowing waters, the blue sucker pokes its elongated head among stones in search of scuds, mayfly nymphs, and other invertebrates it chews in its throat (pharynx) using broad molars called pharyngeal teeth.

Though sometimes confused with the exotic carp, an import from Germany, suckers are of no relation to that oversized minnow. Suckers are found only in North America, except for those swimming in China and northeastern Russia, where scientists believe the fish migrated millennia ago across the Bering Strait.

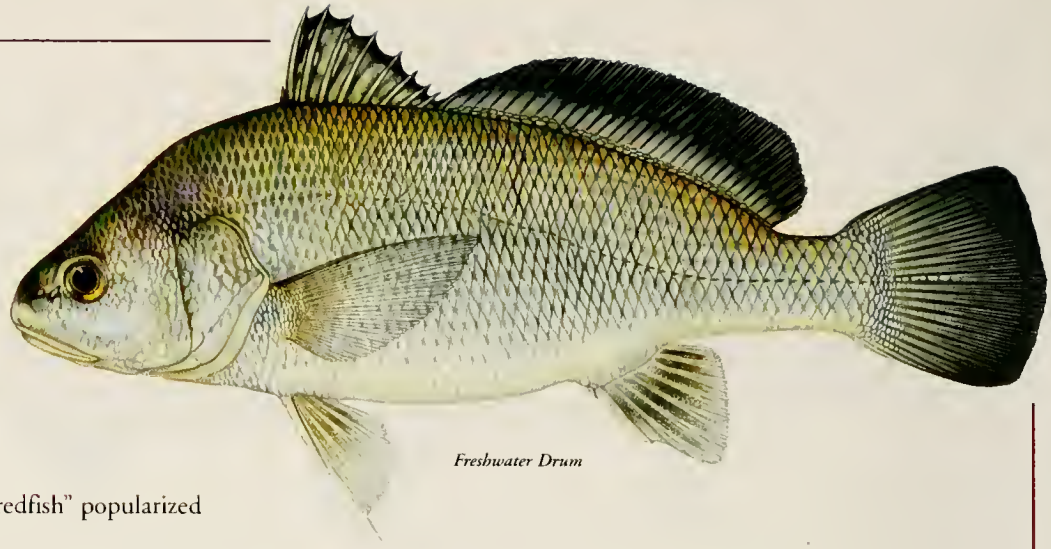


Mountain Whitefish

North American suckers can be grouped roughly into four categories: the buffaloes, the carpsuckers (no relation to the aforementioned exotic), the redhorses, and the suckers—one of which is the blue.

As is the case for many warmwater species, central Montana marks the western range of the blue sucker, which is found throughout the Missouri-Mississippi river system east to Pennsylvania and south to the Gulf of Mexico. The fish is uncommon in Montana, though occasionally one is caught by a lucky angler fishing the Missouri or lower Yellowstone (the state record, an 11.46-pounder, was landed near Miles City in 1989).

Freshwater Drum



Freshwater Drum

Space limits listing the amazing traits of this remarkable fish. Ranging from mid-Canada to Mexico's Yucatan peninsula, the freshwater drum boasts the largest north-south range of any North American freshwater fish. It is also the only freshwater member of the drum family, which includes the ocean fish served as "blackened redfish" popularized in New Orleans restaurants.

This silver, bass-shaped fish is known to scientists as *Aplodinotus grunniens*. Anglers call it sheepshead, croaker, and thunder-pumper. The name in Louisiana is gaspergou (from the French *casburgot*—literally, "to break a clam," referring to its ability to crush mollusks in the heavy molars that line its throat).

Among the drum's other extraordinary features:

- The ability to grunt. By vibrating a unique set of muscles and tendons against its balloonlike swim bladder, a male drum creates a grunting sound in spring during breeding season. The sound is thought to attract females from a distance.
- A lateral line extending to the end of the tail, rather than just to the base, as on other fish. This allows the drum to pick up extra vibrations and better locate food and enemies.
- An oversized otolith. This white half-sphere of rock-hard calcium, found in the inner ear of all vertebrates, is especially large in freshwater drum. Smooth on one side, rough on the other, the otolith floats on cilia and helps the fish stay balanced and oriented in murky water.
- Eggs that float on the water surface until they hatch, sometimes traveling for miles on rivers or wind-swept lakes before the tiny fry emerge. The uniquely buoyant eggs may help account for the drum's continent-wide range.

In Montana, drum are found only in the lower Missouri and Yellowstone rivers and in a few tributaries. Excellent table fare, drum can be filleted and prepared like a walleye or bass.

Shortnose Gar

To call a gar a living fossil is no exaggeration. The long-beaked fish today found finning lazily in the backwaters of the lower Missouri River differs little from those that darted among the tree trunk legs of brontosauruses wading prehistoric swamps.

Like its relatives the longnose and alligator gars, both found in the lower Mississippi River drainage, the shortnose looks like an armored tube of muscle. Covering the cylindrical body is a sheath of interlocking diamond-shaped plates that bend and flex as the fish moves. Hard as tooth enamel, gar "scales" were once used by some American Indians to tip their arrows.

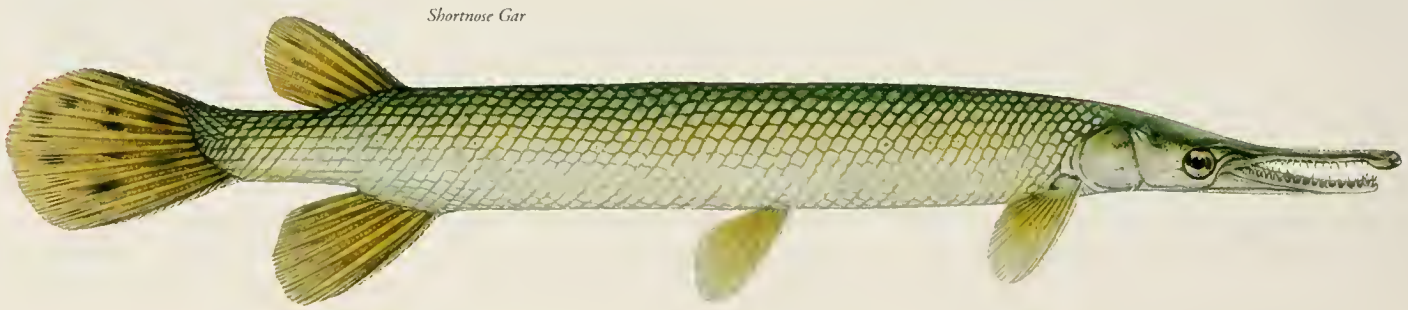
A gar can actually breath air by taking oxygen from the atmosphere into its gas bladder, allowing it to survive in water practically devoid of oxygen. This indomitable fish has been known to live 24 hours or more completely out of water.

Rare in Montana, the shortnose gar can occasionally be found in the Fort Peck dredge cuts, where, on hot summer afternoons, an angler might see its trademark snout break the water surface as the fish gulps a mouthful of air and then submerges.

Females lay bright green, poisonous (to humans) eggs in shallow weedy bays and backwaters that warm to over 70 degrees. The young often lie in groups at the water surface, looking like floating black matchsticks.

Gar favor warm, slow-moving water where they can spend sunny days eating young carp and other minnows dumb enough to swim within reach. ■

Shortnose Gar



State Parks 2002 Events Calendar

AUGUST

2 Bird Sightings of Lewis and Clark, *Lewis and Clark Caverns State Park. 8–9 p.m.* Hear about Lewis and Clark's remarkably descriptive documentations of all the birds sighted while on their epic voyage of discovery. Several beautiful bird mounts will be available for viewing. (406) 287-3541.

2–4 Second Annual Native American Art Show, *Ulm Pishkun State Park.* Browse, shop, and enjoy traditional and contemporary artwork made by Native American artists representing various Montana tribes. (406) 866-2217.

3 Meet Captain William Clark, *Missouri Headwaters State Park. 7–8 p.m.* Historian Ritchie Doylen portrays this historic figure in an enthralling evening of history come to life. (406) 994-6934.

3 Chief Plenty Coups Day of Honor, *Chief Plenty Coups State Park.* This year's theme, Honoring the Arts, recognizes all artisans affiliated with the park since its inception in 1928. (406) 252-1289.

3 "Corks" of Discovery River Float Trip, *Lewis and Clark Caverns State Park.* Enjoy a three-hour guided float trip through the Jefferson River canyon to Lewis and Clark Caverns. (406) 287-3541.

9 Elk, *Lewis and Clark Caverns State Park. 8–9 p.m.* Dick Solum from the Rocky Mountain Elk Foundation will talk about elk habits and habitat. His lively presentation includes skulls and hides of elk and other Montana animals. (406) 287-3541.

JEREMY PUCKETT

FEELING THE HEAT? Head to Giant Springs State Park in Great Falls. In addition to trails and exhibits, the park features lush, cool resting spots next to Giant Springs, one of the largest freshwater springs in the United States.

10 River Quest: Focus on the Missouri River and Its Influence on the Corps of Discovery, *Missouri Headwaters State Park. 7–8 p.m.* Carla Wambach, retired teacher and recipient of the National Presidential Award for Excellence in Teaching Science, will discuss the importance of the river system and other unique environments of Montana on the Corps of Discovery. (406) 994-6934.

10 Crow Life Ways, *Chief Plenty Coups State Park.* Third in a series of demonstrations of cultural traditions, practices, and skills of the Crow Indians. Native crafts, stories, songs, dance, and music. (406) 252-1289.

16 Dutch Oven Cooking, *Lewis and Clark Caverns State Park. 8–9 p.m.* Expert Dutch oven cooker Lynn Anderson will share her techniques and favorite recipes. (406) 287-3541.

16–17 Theater In The Park, *Makoshika State Park.* Enjoy a unique evening of outdoors melodrama in the spectacular badlands setting of the Makoshika amphitheater. (406) 365-6256.

17 Make Your Own Atlatl Dart, *Ulm Pishkun State Park. 9 a.m.–6 p.m.* Jim Ray, president of the World Atlatl Association, discusses the history of the atlatl—an ancient spear-throwing device. He will provide instruction and materials for students to make their own darts. (406) 866-2217.

SHIRT OPTIONAL: A living prehistorian reveals the world of Great Plains life at Fort Owen State Park, located 25 miles south of Missoula. The park also features Montana's first permanent white settlement.

JEREMY RUCKETT

17 My Favorite Lewis and Clark Tales, *Missouri Headwaters State Park. 7–8 p.m.* Hal Stearns, Great Plains writer and lecturer, will tell his favorite stories from the journals of Lewis and Clark. (406) 994-6934.

23 Fire in the Mine, *Lewis and Clark Caverns State Park. 8–9 p.m.* Tom Satterly from Western Montana College in Dillon will make his compelling presentation about a Butte miner in the Granite Mountain Speculator Mine Fire. Gain a new understanding of how brave men dealt with Butte's most devastating event. Sponsored by the Montana Committee for the Humanities. (406) 287-3541.

24 Make Your Own Atlatl Dart, *Ulm Pishkun State Park. 9 a.m.–6 p.m.* Jim Ray, president of World Atlatl Association, discusses the history of the atlatl—an ancient spear-throwing device. Includes instruction for students to make their own darts. (406) 866-2217

24 Life and Times of Patrick Gass: 1771–1870, *Missouri Headwaters State Park. 7–8 p.m.* Jim Sargent, local historian and Headwater Chapter member of the Lewis and Clark Heritage Trail Foundation, will discuss the life and times of this early settler. (406) 994-6934.

24 Crow Life Ways, *Chief Plenty Coups State Park. 1:30–3:30 p.m.* Fourth in a series of demonstrations highlighting native crafts, stories, songs, dance, and music of the Crow Indians. (406) 252-1289.

30 Star Gazing Under the Caverns Sky, *Lewis and Clark Caverns State Park. Begins at 9 p.m.* Tom Satterly from Western Montana College will describe constellations and viewing equipment and then set up telescopes for participants to view Montana's beautiful night. (406) 287-3541.

31 Crow Life Ways, *Chief Plenty Coups State Park. 1:30–3:30 p.m.* The last in a series of demonstrations highlighting native crafts, stories, songs, dance, and music of the Crow Indians. (406) 252-1289.

September

14 John Colter Run, *Missouri Headwaters State Park.* This cross-country foot race commemorates John Colter's historic trek across Montana to escape the Blackfeet Indians. Everyone welcome. (406) 994-6934.

21–22 Second Annual Atlatl Competition, *Ulm Pishkun State Park.* Have fun using this ancient spear-throwing device. Novice and experienced throwers are welcome to participate and see how they would survive as a mammoth hunter. (406) 866-2217.

OCTOBER

26 Bannack Ghost Walks, *Bannack State Park. 7–9 p.m.* The ghosts of Bannack's wild past come alive during this bone-chilling evening. Reservations required. (406) 834-3413.

NOVEMBER

16 Photo Party II, *Chief Plenty Coups State Park.* The community comes together to remember local figures from previous decades involved in this historic park. Participants donate photos to the park and learn about the history of the area through socializing and storytelling. (406) 252-1289. ■

Montana Outdoors PORTRAIT

Red-breasted Nuthatch

(Sitta canadensis)

By Tom Dickson

This small nuthatch (just 4 ½ inches long), blue-gray above and red-brown below, lives year-round in much of Montana and is commonly seen at bird feeders. The name nuthatch derives from the term "nut hack," referring to the bird's habit of wedging nuts and hard seeds into a bark crevice and then hacking them open with its sharp bill. It's also called the topsy-turvy bird and upside-down bird for its habit of scampering headfirst down tree branches.

Appearance: The red-breasted nuthatch is a hyperactive bird that spends most of its time upside down, scrambling along tree branches like a beaked mouse.

Because of the distinct black line extending back from its eye, the red-breasted nuthatch looks a bit like a mountain chickadee. But the nuthatch lacks the chickadee's black throat, its tail is stubbier, its bill is longer and turns up slightly, and it has a rust-colored breast, like the American robin's, rather than the light gray one on the chickadee.

This nuthatch also resembles its larger cousin, the white-breasted nuthatch. But the white-breasted has no eye stripe and has a head that is pure white but for a small black cap. Montana's other nuthatch, the pygmy, resembles the red-breasted but is smaller and has a brown head cap and a white breast.

Sound: These highly sociable birds are constantly chattering among themselves, making a high-pitched, nasal sound described as "yank yank," "kng kng," or "nyack nyack."

Food: Red-breasted nuthatches thrive on nuts and seeds, especially those of spruce and fir. They also eat insect adults, larvae, and eggs, as well as spiders and their eggs. They are drawn to feeders containing chopped nuts, seeds, and suet.

Behavior: Nuthatches scamper along tree branches, often moving downward to find insects and seeds that up-climbing foraging birds such as woodpeckers might miss. A large hind toe provides the red-breasted nuthatch with secure footing as it creeps along the tree bark, and its stubby tail allows the bird to maneuver more easily than a longer one would.

Reproduction: The male and female dig out a nest cavity in a decayed tree or stump, or they will use existing holes and sometimes bird boxes. They line the cavity, which is usually about 8 inches deep, with hair, grasses, dry moss, and shredded bark.

Oddly, the birds also smear the cavity entrance with spruce or pine resin that they bring in their bills. No one is exactly sure why they do it, but the sticky goo could help deter predators such as pine martens or keep other cavity-nesting birds such as house wrens from entering the hole.

The female red-breasted nuthatch lays four to seven eggs, which incubate in 12 days. It takes two to three weeks for the young to fledge, and then they stay with their parents for another several weeks. Throughout this time the parents feed insects to their young.

Habitat: These birds live mainly in coniferous forests, especially those containing tall firs, though they are also found in woodlands along rivers.

Status in Montana: According to John Carlson, zoologist with the Montana Natural Heritage Program, this adaptable species is doing well throughout its range, but because red-breasted nuthatches nest in tree cavities, they could become vulnerable in areas where standing dead and decaying trees are removed.

Though this nuthatch is considered a year-round resident in Montana, it will often head as far south as the Gulf Coast from its northern breeding range when food is in short supply.

"This behavior is unique among North American nuthatches," Carlson says. He also notes that the red-breasted is the only North American nuthatch to occasionally wander over to Europe. ■

JOHN R. FORD

Thunder-pumper

That's just one name for the freshwater drum, also known as sheepshead. For more on drum and Montana's other fascinating yet little-known fish, see page 31. Illustration by Joseph Tomelleri.

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